VOLUME XLVIII NUMBER SIX

THE NATIONAL GEOGRAPHIC MAGAZINE

DECEMBER, 1925

CONTENTS

TWENTY PAGES OF ILLUSTRATIONS IN FULL COLOR

The Taurine World

Cattle and Their Place in the Human Scheme—
Wild Types and Modern Breeds of Many Lands

ALVIN HOWARD SANDERS, D. Agr., LL. D.

With 76 Illustrations

The Cattle of the World

EDWARD HERBERT MINER

20 Paintings in Oil Reproduced in Full Color

PUBLISHED BY THE
NATIONAL GEOGRAPHIC SOCIETY
HUBBARD MEMORIAL HALL
WASHINGTON, D.C.

$3.50 A YEAR 50¢ THE COPY

NATIONAL GEOGRAPHIC SOCIETY

GEOGRAPHIC ADMINISTRATION BUILDINGS

SIXTEENTH AND M STREETS NORTHWEST, WASHINGTON, D. C.

GILBERT GROSVENOR, President — HENRY WHITE, Vice-President
JOHN OLIVER LA GORCE, Vice-President — O. P. AUSTIN, Secretary
JOHN JOY EDSON, Treasurer — GEO. W. HUTCHISON, Associate Secretary
BOYD TAYLOR, Assistant Treasurer — EDWIN P. GROSVENOR, General Counsel
FREDERICK V. COVILLE, Chairman Committee on Research

EXECUTIVE STAFF OF THE NATIONAL GEOGRAPHIC MAGAZINE

GILBERT GROSVENOR, EDITOR

JOHN OLIVER LA GORCE, Associate Editor

WILLIAM J. SHOWALTER, Assistant Editor — RALPH A. GRAVES, Assistant Editor — FRANKLIN L. FISHER, Chief of Illustrations Division

J. R. HILDEBRAND, Chief of School Service

BOARD OF TRUSTEES

CHARLES J. BELL, President American Security and Trust Company

JOHN JOY EDSON, Chairman of the Board, Washington Loan & Trust Company

DAVID FAIRCHILD, In charge of Agricultural Explorations, U. S. Department of Agriculture

C. HART MERRIAM, Member National Academy of Sciences

O. P. AUSTIN, Statistician

GEORGE R. PUTNAM, Commissioner U. S. Bureau of Lighthouses

GEORGE SHIRAS, 3D, Formerly Member U. S. Congress, Faunal Naturalist, and Wild-game Photographer

E. LESTER JONES, Director U. S. Coast and Geodetic Survey

WILLIAM HOWARD TAFT, Chief Justice of the United States

GRANT SQUIRES, Military Intelligence Division, General Staff, New York

C. M. CHESTER, Rear Admiral U. S. Navy, Formerly Supt. U. S. Naval Observatory

J. HOWARD GORE, Prof. Emeritus Mathematics, The George Washington University

FREDERICK V. COVILLE, Botanist, U. S. Department of Agriculture

RUDOLPH KAUFFMANN, Managing Editor The Evening Star

JOHN FOOTE, M. D., Professor of Pediatrics, Georgetown University

JOHN OLIVER LA GORCE, Associate Editor National Geographic Magazine

CHARLES G. DAWES, Vice-President of the United States

JOHN BARTON PAYNE, Chairman American Red Cross

A. W. GREELY, Arctic Explorer, Major General U. S. Army

GILBERT GROSVENOR, Editor of National Geographic Magazine

GEORGE OTIS SMITH, Director U. S. Geological Survey

O. H. TITTMANN, Formerly Superintendent U. S. Coast and Geodetic Survey

HENRY WHITE, Member American Peace Commission, Formerly U. S. Ambassador to France, Italy, etc.

STEPHEN T. MATHER, Director National Park Service

ORGANIZED FOR "THE INCREASE AND DIFFUSION OF GEOGRAPHIC KNOWLEDGE"

TO carry out the purposes for which it was founded thirty-seven years ago, the National Geographic Society publishes this Magazine. All receipts are invested in the Magazine itself or expended directly to promote geographic knowledge.

ARTICLES and photographs are desired. For material which the Magazine can use, generous remuneration is made. Contributions should be accompanied by an addressed return envelope and postage.

IMMEDIATELY after the terrific eruption of the world's largest crater, Mt. Katmai, in Alaska, a National Geographic Society expedition was sent to make observations of this remarkable phenomenon. Four expeditions have followed and the extraordinary scientific data resulting given to the world. In this vicinity an eighth wonder of the world was discovered and explored—"The Valley of Ten Thousand Smokes," a vast area of steaming, sprouting fissures. As a result of The Society's discoveries this area has been created a National Monument by proclamation of the President of the United States.

AT an expense of over $50,000 The Society sent a notable series of expeditions into Peru to investigate the traces of the Inca race. Their discoveries form a large share of our knowledge of a civilization waning when Pizarro first set foot in Peru.

THE Society also had the honor of subscribing a substantial sum to the expedition of Admiral Peary, who discovered the North Pole.

NOT long ago The Society granted $25,000, and in addition $75,000 was given by individual members to the Government when the congressional appropriation for the purpose was insufficient, and the finest of the giant sequoia trees of California were thereby saved for the American people.

THE Society is conducting extensive explorations and excavations in northwestern New Mexico, which was one of the most densely populated areas in North America before Columbus came, a region where prehistoric peoples lived in vast communal dwellings and whose customs, ceremonies, and name have been engulfed in an oblivion.

THE Society also is maintaining expeditions in the unknown area adjacent to the San Juan River in southeastern Utah, and in Yunnan, Kweichow, and Kansu, China—all regions virgin to scientific study.

Copyright, 1925, by National Geographic Society, Washington, D. C., in the United States and Great Britain. All rights reserved. Entered at the Post Office at Washington, D. C., as Second-Class Mail Matter. Acceptance for mailing at special rate of postage provided for in Sec. 1103, Act of October 3, 1917, authorized July 1, 1918.

TIFFANY & CO.

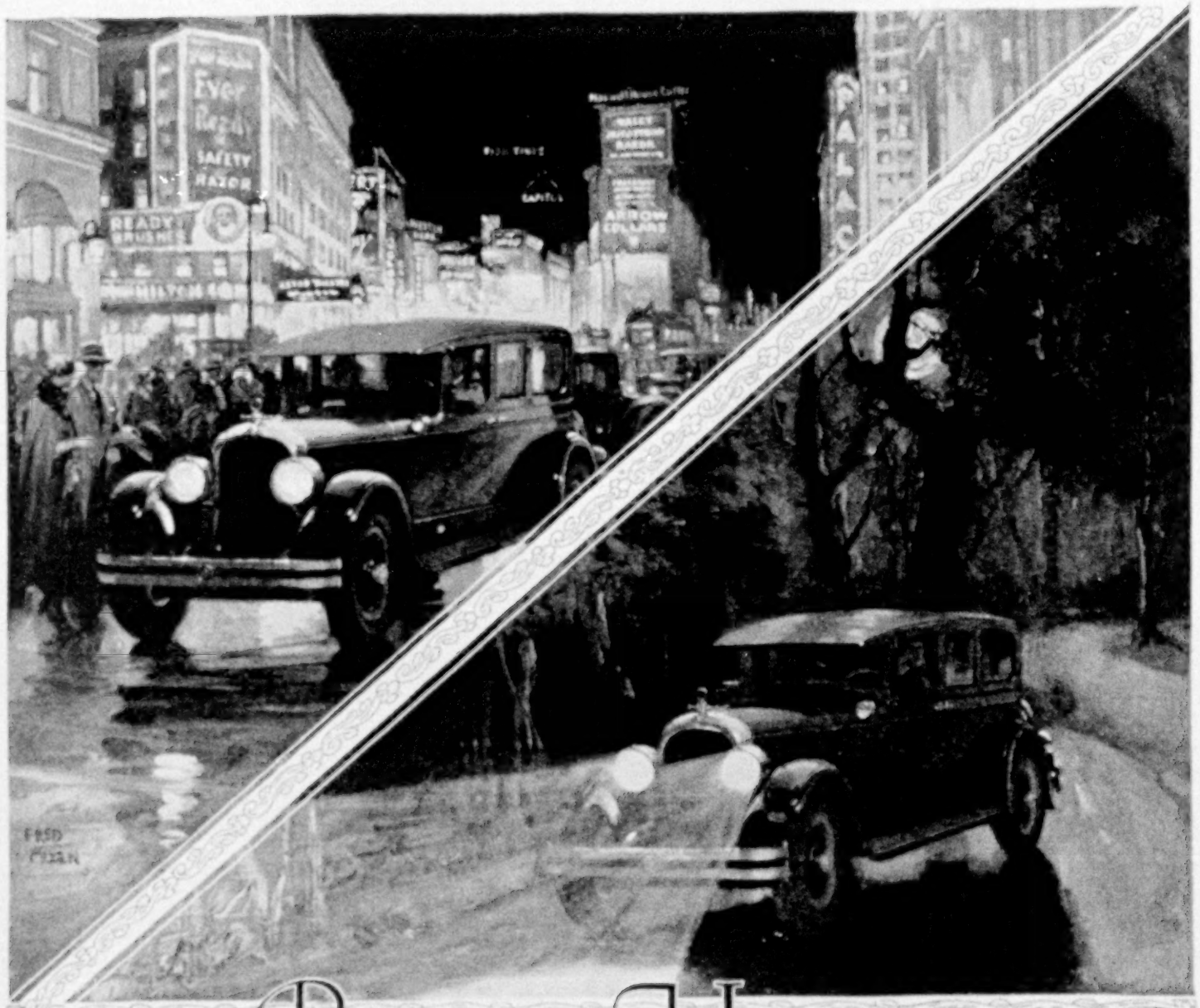
JEWELRY WATCHES SILVERWARE

Noted for Quality

MAIL INQUIRIES RECEIVE PROMPT ATTENTION

FIFTH AVENUE & 37TH STREET

NEW YORK



BROADWAY *or* HIGHWAY

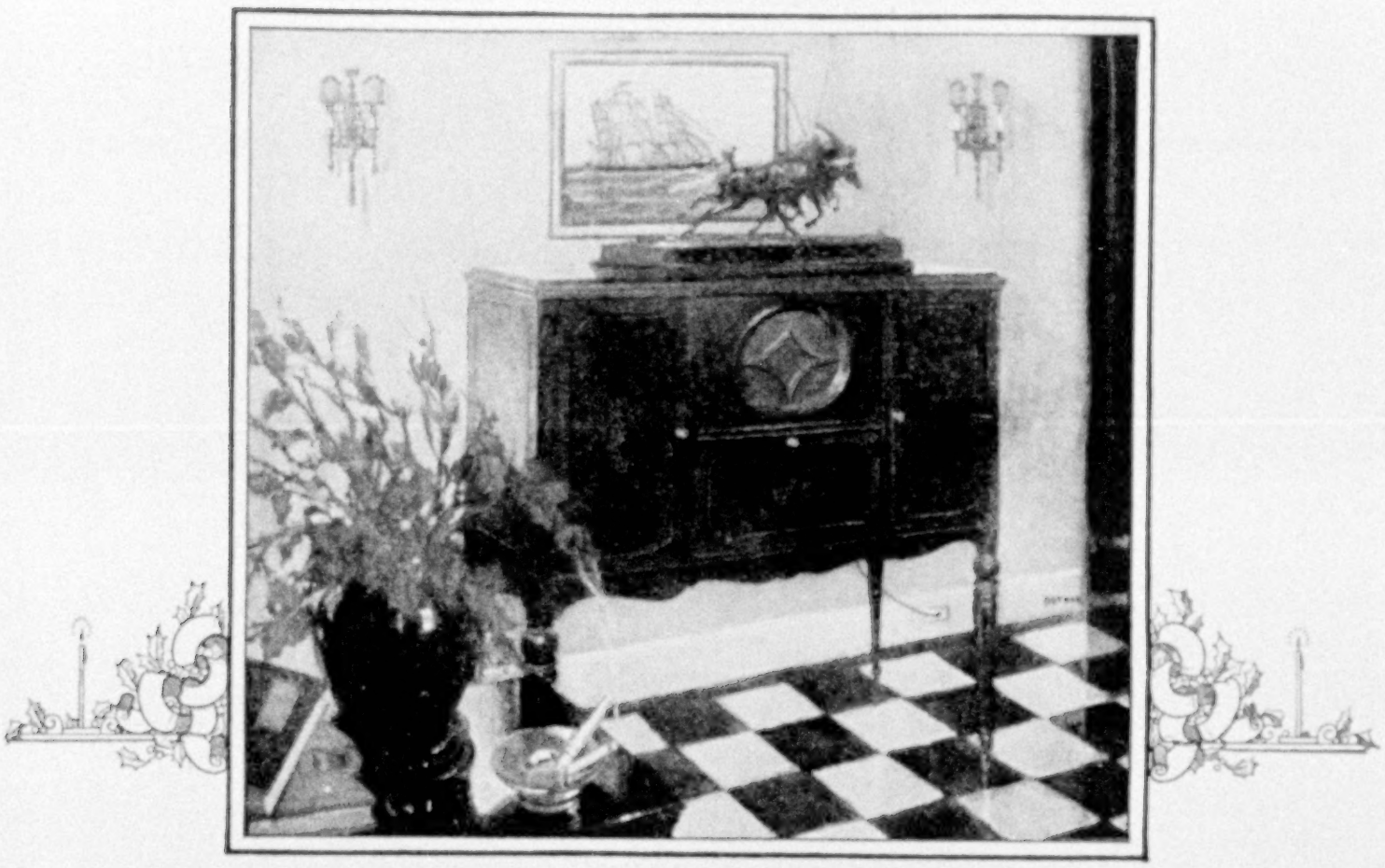
– it's all the same to a Marmon

WHETHER your motoring habits and inclinations keep you on the pavement or carry you across the continent, the New Marmon will answer your requirements masterfully . . . luxuriously . . . faultlessly. To the recognized prowess of this great automobile, new and ingenious engineering developments have now added an amazing new super-smoothness of power-flow which is evident the moment you drive the car. The effect has been aptly compared to that few minutes of best behavior which the owner of any good car sometimes enjoys at night, when the damp air gives that last finishing touch of power. This quality is now evident in the New Marmon any hour of the day and under all conditions.

The Greater New Marmon is now available for demonstration at Marmon salesrooms throughout the country

"It's a Great Automobile"

The NEW MARMON



An eight tube Super-Heterodyne that uses no batteries

A single control for tuning—and power taken from the lighting circuit—as easy as switching on a lamp!

Radiola 30 is the new eight-tube Super-Heterodyne in a tall, finely built cabinet. With it is the new power loudspeaker that can equal the actual volume of an orchestra. It can make you feel the very presence of the artists, give you true reproduction at any volume you want. You can suit the loudness of your reception to the size of your room, and reproduce any performance *exactly*, in tone quality and volume.

The device in Radiola 30 which eliminates all A, B and C batteries has special arrangements to *control the voltage*, so that no matter how the line current from the power house may vary, your reception never varies. It operates on any 60 cycle, 110 volt A.C. lighting circuit.

Radiola 30 is so built that time and weather cannot hurt it—so remarkable in its performances that new discoveries will not replace it. It is a radio receiver that will last through the years.

Radiola 30, entirely complete $575

RCA-Radiola

MADE BY THE MAKERS OF RADIOTRONS

RADIO CORPORATION OF AMERICA NEW YORK CHICAGO SAN FRANCISCO

AROUND *the* WORLD

On the World's Pre-eminent Cruising Ship

the specially chartered Cunarder

"FRANCONIA"

From New York Jan. 14th, 1926

The supreme event of a lifetime achieving the grand circuit in 133 days, sailing eastward in the path of spring. *No crowding, no confusion. Most comprehensive itinerary. Our own offices with their special facilities all along the route.*

The CRUISES SUPREME

to the MEDITERRANEAN

On the White Star "Ship of Splendor"

"HOMERIC"

Specially chartered to sail

from New York Jan. 23d, 1926

An opportunity beyond compare, traveling with leisure and in comfort *on the largest and most replete steamer sailing to the Mediterranean.* An abounding itinerary; a long stop in Egypt and stopover privileges in Europe.

THOS. COOK & SON

New York Philadelphia Boston Chicago St. Louis
San Francisco Los Angeles Toronto Montreal Vancouver

Good accommodations of various types are still available on both cruises; early applications are advisable.

Santa Claus' Daughter Gets The Best Time Of All

When Santa Claus has finished his job of remembering the rest of the world, he drops quietly around to the jewelry store.

And there, unhurried and unjostled, he requisitions the Christmas joy for Mrs. Claus and the younger Clauses.

SOME folks think of the jewelry store as the place to go, chiefly, for those gifts where expense is the second consideration.

But not Santa Claus! That canny old gift expert knows better than that!

He judges the worth of a gift not alone by what it costs, but by what it yields—in service and satisfaction. . . . And long ago, he discovered that a dollar goes farther at the jewelry store than it does anywhere else, in procuring enduring usefulness and pleasure.

For the jeweler deals in imperishables—in GIFTS THAT LAST, like the fidelity of a fine friendship, for as long as life itself!

Specializing in jewels, the jeweler sees to it that every article in his stock is truly a jewel. And whether it be for adornment or for utility, it must measure up to *jewel-standards*, in craftsmanship and integrity.

He who must coddle a lean purse or she who may indulge a fat one, both will find there the gifts they would most like to give—comfortably priced within their respective Christmas budgets.

But whatever the price, the quality is always jeweler's quality—uncompromising in its fine standards.

Ask Santa Claus. He knows!

ELGIN

THE WATCH WORD FOR ELEGANCE AND EFFICIENCY

ELGIN NATIONAL WATCH COMPANY, ELGIN, U. S. A.

© 1925, E. N. W. Co.

Gifts that Anyone Would Like to Receive

Gold-filled combination set, Wahl Pen and Eversharp Pencil, in handsome Gift Box

$13

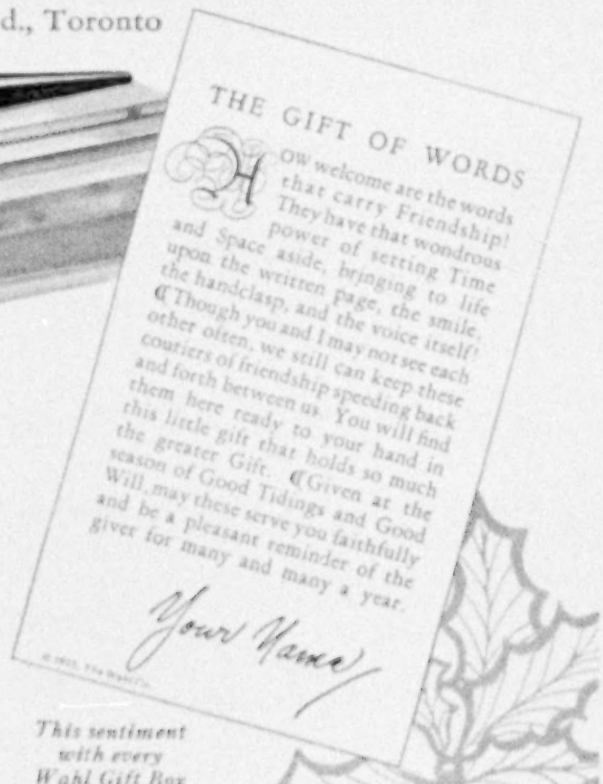
SURELY, the finest thing about any Christmas gift is the sentiment of Friendship. Nothing, however costly, takes its place. But the best gift is better, when it is the gift your friend would like to receive. To find such gifts, you have only to visit any counter where the new Eversharps and Wahl Pens are shown. Either singly or in combination, these fine articles of personal use and adornment meet every gift requirement. They are offered in a wide variety of beautiful designs. They are priced to suit your purse. They are known the world over for their value.

THE WAHL COMPANY, 1800 Roscoe Street, *Chicago*, Illinois

Made in Canada by THE WAHL CO., Ltd., Toronto

Now! *A Fountain Pen Desk Set*

Here is something entirely new and universally needed. A most attractive and modern writing set for every home and office desk. It puts an end to desk clutter and supplies the last word in neatness and utility. A Wahl fountain pen gold-mounted on a beveled base of crystal or jet glass—$12. With gold-filled Wahl pen, $15. Originated and manufactured only by Wahl for Wahl Pens.


THE GIFT OF WORDS

HOW welcome are the words that carry Friendship! They have that wondrous power of setting Time and Space aside, bringing to life upon the written page, the smile, the handclasp, and the voice itself! ¶Though you and I may not see each other often, we still can keep these couriers of friendship speeding back and forth between us. You will find them here ready to your hand in this little gift that holds so much the greater Gift. ¶Given at the season of Good Tidings and Good Will, may these serve you faithfully and be a pleasant reminder of the giver for many and many a year.

Your Name

This sentiment with every Wahl Gift Box

The New EVERSHARP and WAHL PEN

Mastery of Power

Ask the man who owns one

THE new series Packard Eight brings a new zest for motoring to those who long ago ceased to drive for pleasure.

Smooth, quiet, truly beautiful in performance, it is pleasing to sense your mastery of its eighty horse-power.

The new Packard steering and front spring suspension at all times assure your safety and ease on low-pressure tires.

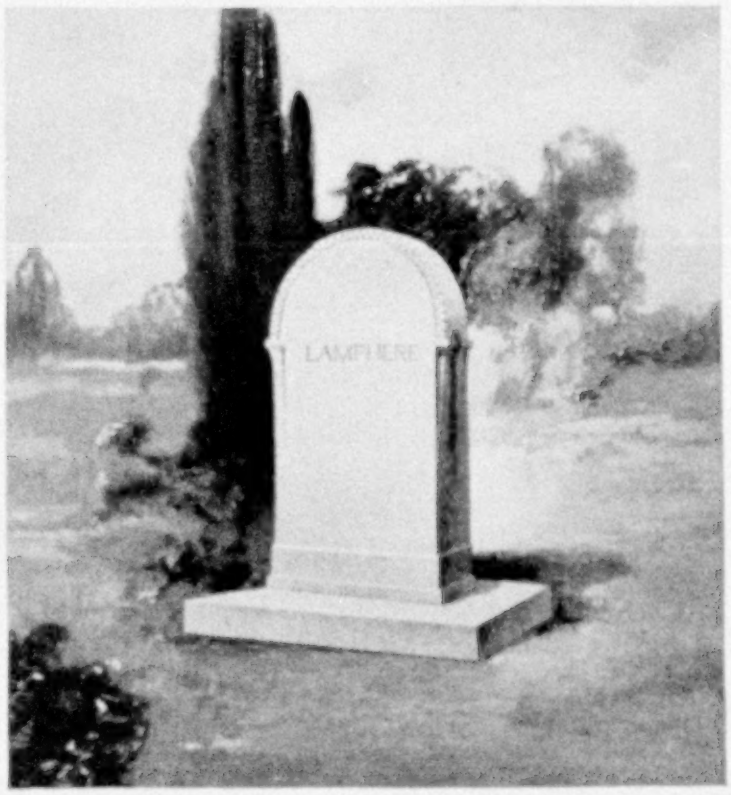
And like a great, healthy animal the new Packard Eight requires little attention to be always in the pink of condition. The chassis lubricating system and the oil rectifier make that attention almost automatic. Together, they double the life of the car.

Behind the wheel of a Packard Eight you may learn the true meaning of luxury, comfort and distinction in travel.

The Packard Eight five-passenger Sedan is illustrated, $4750 at Detroit

The Packard Eight is provided in nine body types—four open and five enclosed. Packard dealers welcome the buyer who prefers to purchase out of income instead of capital.

PACKARD



Rock of Ages Barre

The Granite for Every Memorial Purpose

ROCK OF AGES, that wondrous Barre granite of permanent charm and durability, is equally appropriate in stately mausoleum or modest headstone. It is a granite of universal use—it does honor to either king or peasant.

Rock of Ages is a Barre granite of surpassing fineness. Its smooth, regular grain and natural blue-gray color are equally attractive in hammered or polished finish. It takes the most delicate carving.

Mark Every Grave

With Rock of Ages Barre Granite

Do not delay the choice of your family memorial in Rock of Ages Barre Granite. Booklet "E" will help you decide—Write for it.

Be sure to request our Certificate of Perfection when placing your order with your local memorial merchant. It is your guarantee of Rock of Ages Barre Granite, and protects you against inferior substitutes.

BOUTWELL, MILNE & VARNUM CORPORATION

MONTPELIER, VERMONT

Quarriers Rock of Ages Barre Granite—Quarries at Barre, Vermont

The Instrument of the Immortals

RACHMANINOFF playing Chopin's C Sharp Minor Scherzo—his instrument lending glamour and enchantment of tone to music that is in itself pure magic. . . . Hofmann playing a Bach fugue—the clear, brilliant roulades carried to the farthest listener by the instrument he chose long ago to interpret his genius. . . . Paderewski thrilling packed audiences by his dynamic rendition of Beethoven's Emperor Concerto—with the Steinway meeting his excessive demands as perfectly as it has met them for thirty-four years. . . .

Every music lover knows these great moments of music. And as the first chords are sounded, before the genius of pianist and composer sweeps away all details, every true lover of music renders his unspoken tribute to the miraculous singing tone of the Steinway piano.

For the tone of the Steinway is probably its best known characteristic. The extraordinary durability of the Steinway, its beauty of form and finish, its amazingly quick response to the hand and spirit of the musician—these are known and praised in every musical center of the world. But nothing touches the heart of a musician like the superbly clear and delicate treble, the floating golden mezzo-tones, the velvety depth and sonority of the bass. In the silence of the Steinway showrooms, where the Steinway speaks for itself in a voice like no other voice in the world, the full, rounded beauty of its tone can be discerned. . . . And no matter how strongly you may express your appreciation and approval, you may be assured that it has all been said before you—by hundreds of the most celebrated figures in the world of music for more than half a century.

The Steinway is made in numerous styles and sizes to fit the acoustic conditions of

SERGEI RACHMANINOFF
uses the Steinway exclusively

your home and the limitations of *your* income. It is sold, as it has always been sold, at the lowest possible price. It is easily and quickly obtainable upon the most convenient terms. And to all its admitted advantages the Steinway adds the definite gift of permanence. It will endure through generation after generation. You need never buy another piano.

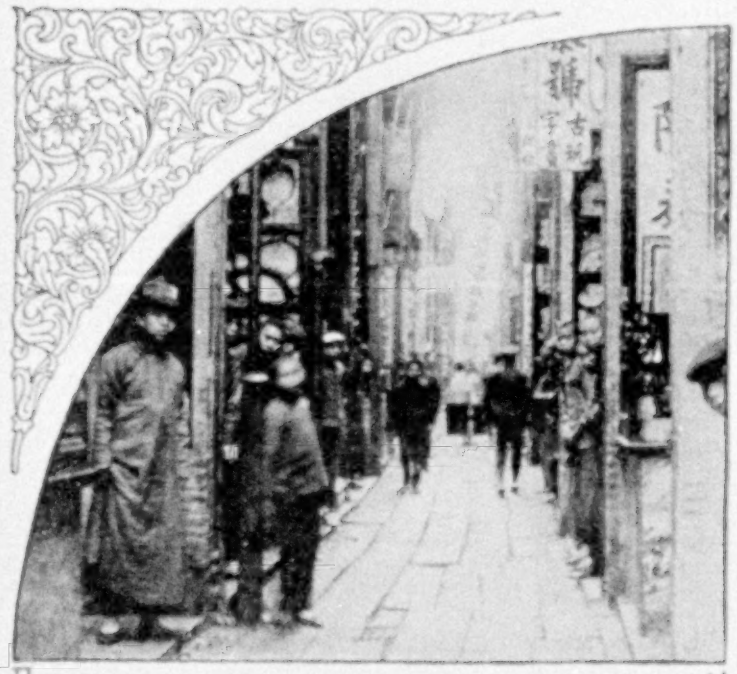
There is a Steinway dealer in your community or near you through whom you may purchase a new Steinway piano with a small cash deposit, and the balance will be extended over a period of two years. *Used pianos accepted in partial exchange.

Prices: $875 and up *Plus transportation*

STEINWAY & SONS, STEINWAY HALL
109 W. 57th Street, New York

STEINWAY THE INSTRUMENT OF THE IMMORTALS

WINTER CRUISES



Around the World

on the

RESOLUTE

FOR four months, an enthralling panorama of strange lands weaves spells of enduring enchantment. The prosaic every-day is forgotten. Perfect service, perfect management and a perfect cuisine complement the fascinating tour.

Sailing
From New York
Jan. 21, 1926
From Havana
Jan. 26, 1926
From Los Angeles
Feb. 6, 1926
From San Francisco
Feb. 9, 1926
Rates $1500 and up including shore excursions

To the West Indies

on the

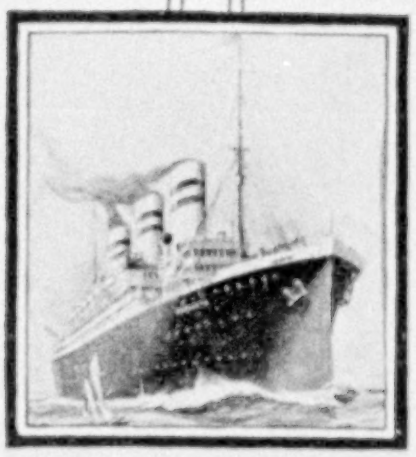
RELIANCE

THE blue sky and blue sea welcome you. Winter seems far away. Panama and the Spanish Main whisper romantic tales, and the gorgeous islands and quaint natives make the shore trips fascinating adventures.

Sailings

Dec. 21 — 14 *days*
(S. S. RESOLUTE)
Jan. 9 — 15 *days*
Jan. 27 — 27 *days*
Feb. 27 — 27 *days*
April 1 — 14 *days*

Rates $150 and $250 and up



World Renowned Cruising Steamships

For full information about these splendid cruises, send to

UNITED AMERICAN LINES

(HARRIMAN LINE)

35-39 Broadway, N. Y.
230 S. 15th St., Philadelphia
177 N. Michigan Ave., Chicago
87 St. James St., Montreal
or local steamship and tourist agents
131 State St., Boston
574 Market St., San Francisco

GREATEST BARGAIN IN 157 YEARS!

The Famous Britannica

[New Form] at nearly *half* price!

if you act promptly

THE Encyclopædia Britannica in the New Form is the biggest seller in the book world. It is the best value ever offered in the 157 years of the Britannica's history!

Now—today—you can buy this library of knowledge—the equivalent of 476 books of ordinary size—for much less than the cost of a typewriter, phonograph, washing machine or a good radio set.

The low price of the Britannica in the New Form is remarkable—"The bargain of a lifetime," is the comment of thousands. And you, too, can own this great work.

At a saving of 46%

An innovation in publishing enables us to offer you the complete Britannica in the New Form at a saving of 46 per cent on the price of the famous Cambridge issue! And the set of 16 double volumes, beautifully bound in cloth or in half-morocco, will be delivered to your home or office for a *small first payment.*

The Britannica in the New Form is identical in contents with the Cambridge issue, the famous large page, large type issue Britannica which is known throughout the civilized world and sells for twice as much.

It is the latest revised, complete and unabridged edition of this famous work. It contains 49,000,000 words, 15,600 illustrations, 33,000 pages, 500,000 facts—*it would cost more than $1000 for this material, buying single volumes of average size!*

The Britannica is as interesting as it is authoritative. Every article is easy to find. Its narrative style holds the reader's attention. Every subject of human interest is covered—art, literature, invention, the latest developments in modern science, history, biography, a complete, unbiased story of the World War and its momentous consequences. . . . Think what you could do with such a fund of authentic information.

Why the price is so low

The Britannica in the New Form is the result of years of research, combined with the recommendations of Britannica owners.

The following innovations in publishing made possible great savings:

—Binding the complete Britannica in 16 double volumes instead of 32 single volumes.

—Using thin yet durable Britannica Opacity Paper—2400 tons purchased at a very favorable price.

—Printing the New Form from the plates of the latest revised, large type plates of the Cambridge issue, thereby saving the cost of setting up 33,000 pages of type.

These savings make the Britannica in the New Form the greatest book in the world—at the lowest price.

Only 3605 sets left

Thirty-six thousand sets of the New Form were sold since it was brought out. And only 3605 sets of a fourth printing of 10,000 sets remain unsold. . . .

Write today for interesting book—free

Send the coupon below. We will send you particulars of this offer—a description of the Britannica in the New Form—reproduction of many specimen pages—the story of how such a low price was made possible. . . . **All yours—free—in an instructive, interesting 56-page book!**

THE ENCYCLOPÆDIA BRITANNICA, Inc.
342 Madison Avenue, New York NGM 5-3E

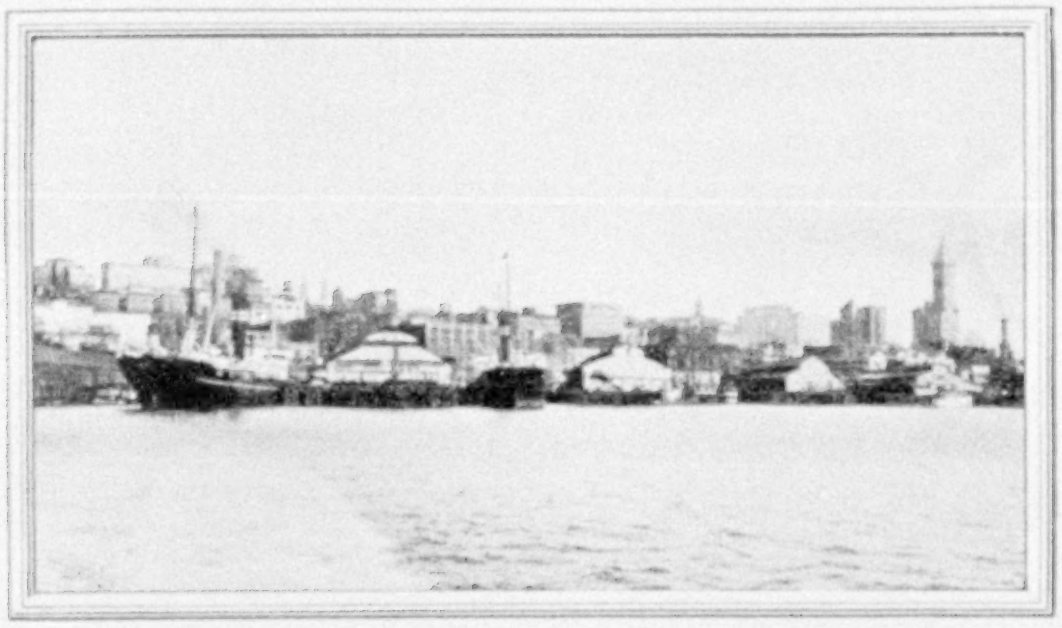
Please send me complete information about the Encyclopædia Britannica in the New Form. Also send me the illustrated, 56-page Specimen Book, full details of your present low-price offer and your easy plan of small monthly payments. This does not obligate me.

Name.....

Address.....

Beautiful mahogany-finish bookcase free while this offer lasts!

PACIFIC NORTHWEST



Alaska's millions today and her billions of tomorrow must move through our Alaskan doorway, the ports of the Pacific Northwest

Watch ALASKA!

The United States bought Alaska for $7,200,000 in 1867.

Since that time Alaska has exported products worth 140 times its purchase price.

Last year it exported commodities valued at $67,846,000, and imported goods worth $30,567,000.

But Alaska has only begun. It has 20 million acres of merchantable timber, and coal resources estimated at 150 billion tons. It has 100,000 square miles of good farm lands, and fisheries now producing 40 to 50 millions of dollars annually. Its metal, mineral and oil resources cannot be estimated.

The gateway to this vast, scarcely touched treasure land is the Pacific Northwest.

The ports of Washington and Oregon are the channels through which by far the largest part of its commerce has flowed in the past—and will flow in the future.

The development of Alaska, now being pushed in earnest, will add billions to the trade volume of the Pacific Northwest ports. For the Pacific Northwest is and must be always the market place of Alaska.

The Chicago Burlington & Quincy R.R.
The Great Northern Ry.
The Northern Pacific Ry.

NORTHERN PACIFIC
Burlington Route
GREAT NORTHERN

In three months, public recognition of the value of the *better* Buick has been so sweeping that to-day *one* in every *four* cars sold for $1000 or more is a

better BUICK

the best way to begin a California winter

is Santa Fe *"all the way"*-
the shortest route
Chicago *to* California

Another exclusive Santa Fe feature
is Fred Harvey dining service-
5 daily Santa Fe trains

After California — Hawaii

mail this

W. J. Black, Passenger Traffic Manager, Santa Fe System Lines, 1251 Railway Exchange, Chicago, Illinois
Send me Santa Fe picture-folders of winter trip to California.

.....

.....

Raymond-Whitcomb Cruises

THEY are famous throughout America as the best way to travel. The Ships are invariably new liners—fresh, clean, and up-to-date—especially adapted for long cruise voyages. The Routes are planned to give the maximum of sightseeing that is consistent with comfort. Shore Excursions are varied and comprehensive. The Management is experienced, painstaking and agreeable. And the Raymond-Whitcomb Clientele represents the best class of American travelers.

to the West Indies

(On the largest ship ever to go to the Caribbean)

Two Winter Cruises to the most interesting waters of the Western Hemisphere, where picturesque old outposts of Spain and France slumber amid palms and bougainvillea. The Cruise Ship—S.S. *"Columbus"* (32,000 tons)—is the newest of the world's great liners, and the largest and most luxurious ship ever to sail on a West Indies Cruise. There are visits to 14 places in the *West Indies* and *South America*, including *Havana, Kingston, Caracas* and *Panama*. All the sightseeing trips and shore excursions are included in the price. Sailing January 30 and February 25. Rates from $375.

to the Mediterranean

A new Cruise which opens fresh possibilities to the traveler. It will sail in April and will be in the *Mediterranean* at the most delightful season. A five-week voyage with visits to the brilliant resorts of the *Riviera;* to historic cities such as *Granada, Algiers, Naples* and *Athens;* and to several fascinating old places that are new on Cruises. On the S.S. *"Carinthia"* (20,000 tons)—a new Cunard liner designed especially for Cruises. Sailing April 3. Rates (including return at any date) $625 and upward.

A Winter Cruise visiting *Nice* during the *Carnival;* the *Alhambra* without extra charge; *Palermo* and *Syracuse; Venice, Cattaro,* and the *Greek Islands*—in addition to the "standard" ports. Sailing January 28 on the *"Samaria"*. Rates (including return) $925 & up.

Individual Travel Service

Made-to-order trips in *Europe* and *America.* We will not only help plan such journeys, but will make all the arrangements in advance, securing railroad and steamship tickets and reserving rooms at hotels. With this wise preparation the traveler will be spared the usual anxiety and trouble, and will be free to enjoy himself.

Send for booklets describing any Cruises or Tours or the Raymond-Whitcomb Guides to European Travel or to American Travel.

Raymond & Whitcomb Co.

26 Beacon Street, Boston

New York *Philadelphia* *Chicago* *San Francisco* *Los Angeles*

Sunset Limited
De Luxe Train
to California

A FASCINATING journey over a mild, pleasant route particularly rich in historic interest.

Club car with barber shop, shower bath and valet service. Observation car with ladies' lounge, shower bath, maid, manicure and hair-dressing service. De luxe sleeping and dining cars. All the best in modern travel without extra fare!

DAILY SERVICE

New Orleans to Los Angeles, San Diego and San Francisco, with through sleeping cars for the 120-mile Apache Trail motor side trip, and for San Diego via marvelous Carriso Gorge.

For information and literature address:

NEW YORK
165 Broadway

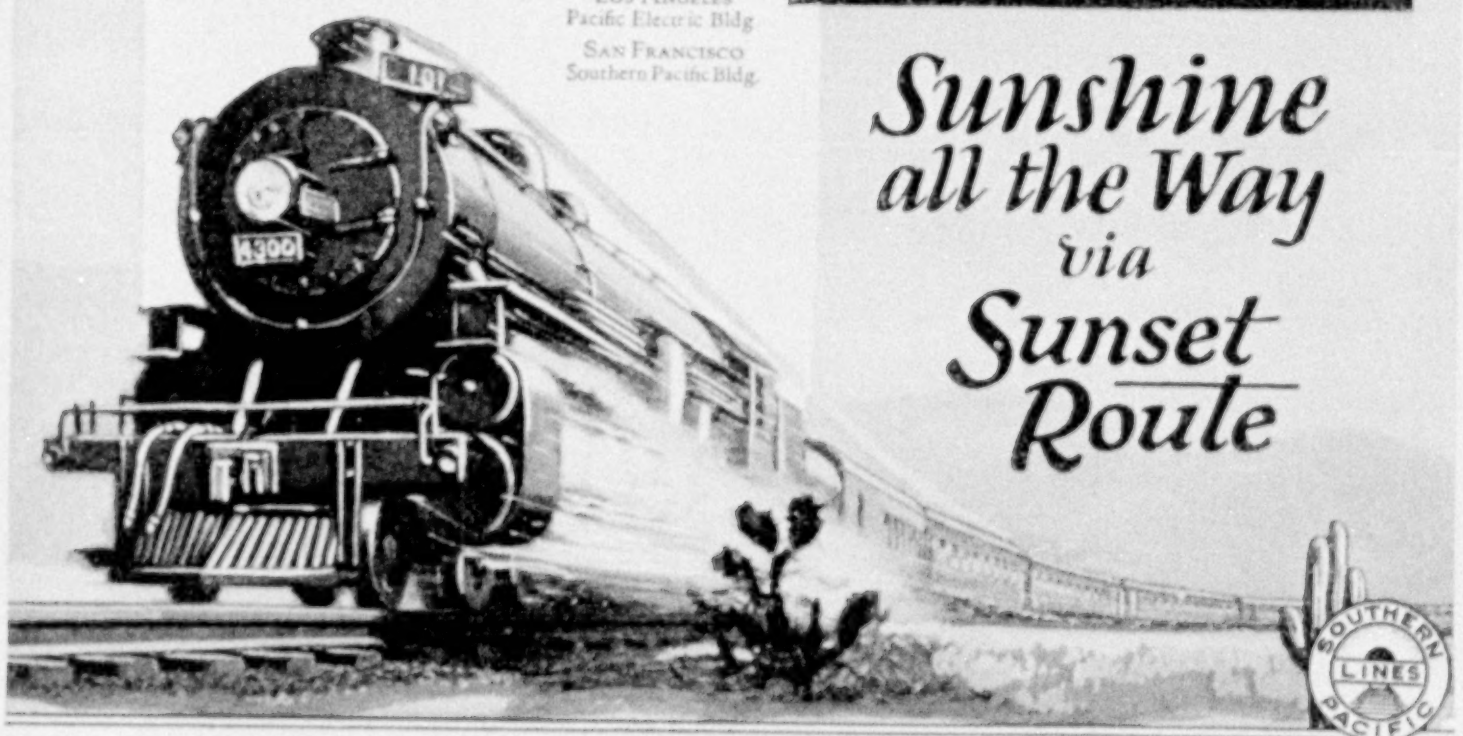
CHICAGO
35 W. Jackson Blvd.

NEW ORLEANS
Pan Am. Bk. Bldg.

HOUSTON
Southern Pacific Bldg

LOS ANGELES
Pacific Electric Bldg

SAN FRANCISCO
Southern Pacific Bldg.



Sunshine all the Way via Sunset Route

SOUTHERN PACIFIC LINES

FACTS ABOUT A FAMOUS FAMILY

The greatest values in automobile history

GENERAL MOTORS believes that Chevrolet, Oldsmobile, Oakland, Buick and Cadillac now offer the greatest values in automobile history.

Important improvements in chassis construction add to simplicity and performance. Refinements in body designs increase attractiveness and comfort.

Every change has been made with quality as the prime consideration. Quality is the first law of General Motors. Enormous sums have been invested in more intensive engineering, in labor-saving methods, in reconstruction—wherever a better result might be achieved.

Naturally, large economies are attainable in such an organization as General Motors. It enjoys every advantage of quantity production; it sells in every market of the world. General Motors is passing these economies on to the purchaser. This makes possible the extraordinary values now offered.

The public may depend upon these values. Every car is a car of quality.

GENERAL MOTORS

BUICK . CADILLAC . CHEVROLET . OAKLAND
OLDSMOBILE . GMC TRUCKS

General Motors automobiles may be purchased on the GMAC Time Payment Plan
Always lowest, GMAC rates are now lower still

Bark healing perfectly over Davey cement filling. A burr oak on the estate of Mrs. Edith Rockefeller McCormick, Lake Forest, Illinois.

What does Davey Tree Surgery cost?

More than 80% of Davey clients are people of moderate means and invest relatively small amounts

In 1925 Davey Tree Surgeons served 13,086 clients.

Of these 9289 paid less than $100 each.
1972 paid from $100 to $200 each.
1525 paid from $200 to $500 each.
298 paid from $500 to $15,000 each.

Although Davey Tree Surgeons serve a majority of the best known and wealthiest families in America, an overwhelming proportion of their clients are people of moderate means.

Nearly 600 Davey Tree Surgeons are at work, some of them living near you, anywhere between Boston and Kansas City, from Canada to the Gulf.

THE DAVEY TREE EXPERT CO., Inc.
317 City Bank Building
Kent, Ohio

Attach this coupon to your letterhead and mail today

THE DAVEY TREE EXPERT CO., Inc., *Reg. U. S. Pat. Off.*
317 City Bank Bldg.,
Kent, Ohio

JOHN DAVEY
Father of Tree Surgery

Gentlemen: Without cost or obligation on my part, please have your local representative examine my trees and advise me as to their condition and needs.

We shall be pleased to send you Mediterranean Cruise literature. Address: Cruise Department, No. 1 Broadway, New York City.

The "Outline of History" on the Mediterranean

EACH epoch of history—ancient and modern—is revealed as you follow the itinerary of this splendid cruise around the Mediterranean. A masterpiece of travel arrangement made possible by 54 years' experience on the part of White Star and Red Star Lines. Flashing contrasts—the modern gaiety of the Riviera and the beauty of Italy; then Greece, the Holy Land, Constantinople and Egypt, eloquent of remote ages. Ample time is allotted at each port of call.

Itinerary: New York, Madeira, Gibraltar, Algiers, Monaco, Naples, Athens, Dardanelles, Constantinople, Haifa (for Holy Land), Alexandria (for Egypt), Syracuse, Naples, Monaco, Gibraltar.

Your cruise home is a famous ocean liner where utmost service and luxury surround you for the brief spaces between ports of call.

White Star liner **Adriatic**
Jan. 7 and Feb. 25
Red Star liner **Lapland**
Jan. 16 and Mar. 6

Back home in 46 days. Liberal stop-over privileges from one ship to the other. Optional return via North European port, permitting visits to Paris or London.

$690 and up, including shore trips

West Indies Cruises: 30-31 Days
White Star liner *Megantic*
January 23rd and February 27th.

WHITE STAR LINE
RED STAR LINE
No. 1 Broadway, New York, or authorized agents

Prevent this

Worried about the appearance of her teeth

WHY all this talk about tooth decay? Because it truly is a menace to the nation's health.

If this sounds exaggerated to you, just ask your dentist. Let him tell you how prevalent it is and how serious are the consequences.

When causes of tooth decay are removed, children do better work in school, men and women feel better, look better and actually live longer. Authorities support these statements.

As a student of humanity, Oliver Wendell Holmes realized how much good, sound teeth contribute toward personal charm. And as a physician he could appreciate their relation to good health. He wrote:

"To woman . . . there is no element of her wondrous beauty which can take the place of white, even, well-shaped teeth. And as beauty is not a mere plaything, but a great force, like gravity or electricity, *the art which keeps it, mends it, and, to some extent, makes it, is of corresponding importance.*"

Preventive dentistry is vital to humanity. Its importance can't be overestimated. Tooth decay must be combated with every means that science can command.

Give yourself a chance!

These Chicago children are given a chance to escape disease through the free dental clinic at Cook County Hospital. 30,000 children were given treatment in 1924.

Use Colgate's—

It *removes causes* of tooth decay

The happy smile of healthy teeth

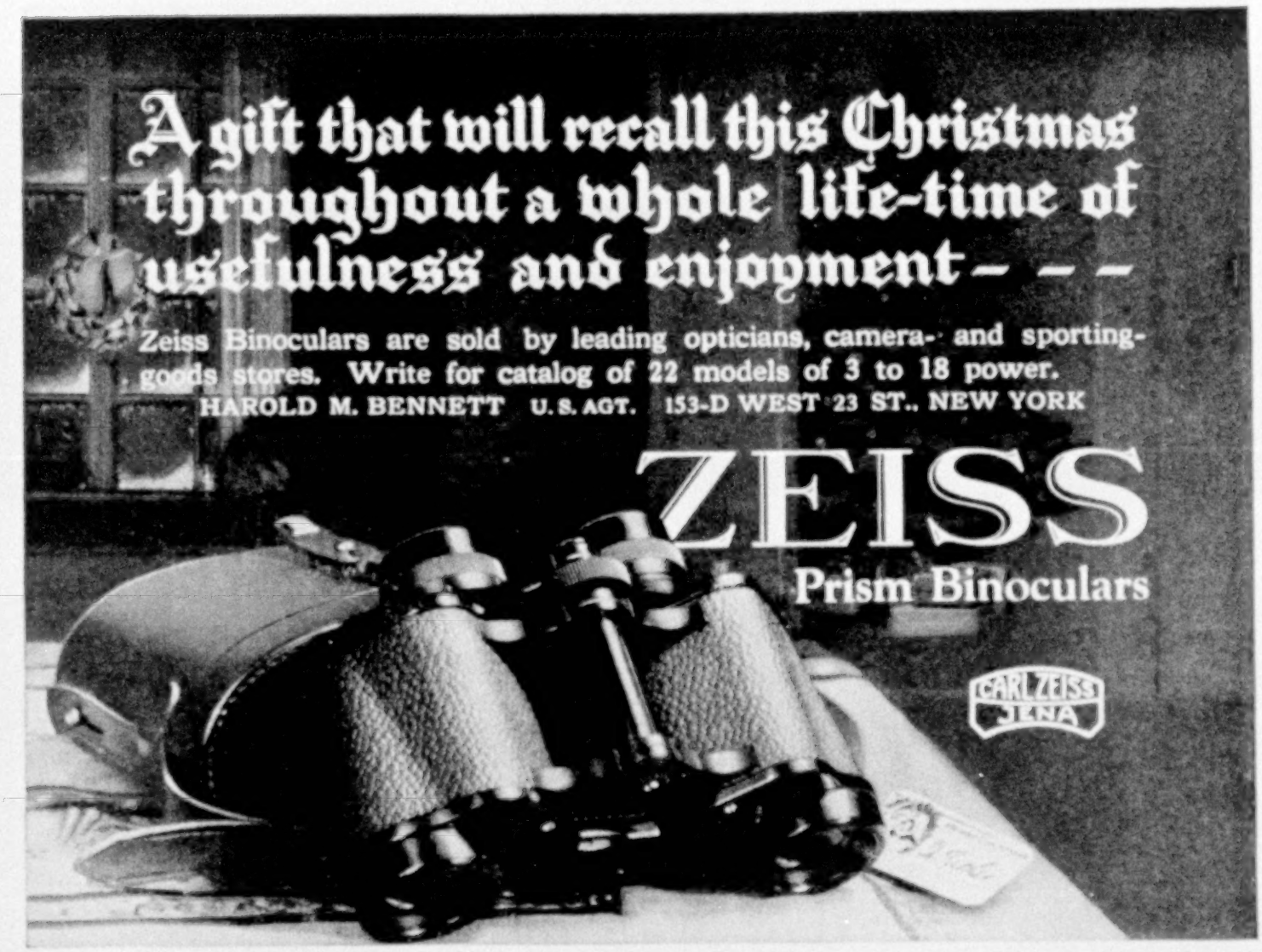
PRESERVE the youthful charm of your smile by sensible care of your teeth. Don't wait until tooth decay sets in. Prevent it in the way that modern dental science approves.

Preventive dentistry—the combating of disease by the prevention of tooth troubles—is the new note in advanced dental practice. Colgate's Ribbon Dental Cream has always been in the forefront of this scientific move for better teeth and health. Colgate's is a preventive dental cream, pleasant to use, and thoroughly effective. It *removes causes* of tooth decay.

"Washes", Polishes, Protects

Colgate's contains no harsh grit—no dangerous ingredients. It "washes" your teeth gently and safely. Its principal ingredients are fine chalk and mild soap, the two substances recommended by such eminent dental authorities as Dr. A. C. Fones, of Bridgeport, Conn., and Dr. Herman Prinz, of Philadelphia, Pa. The fine chalk is the polishing agent. The soap supplies the needed washing action. The combined action protects by removing clinging particles of food from the teeth and edges of the gums.

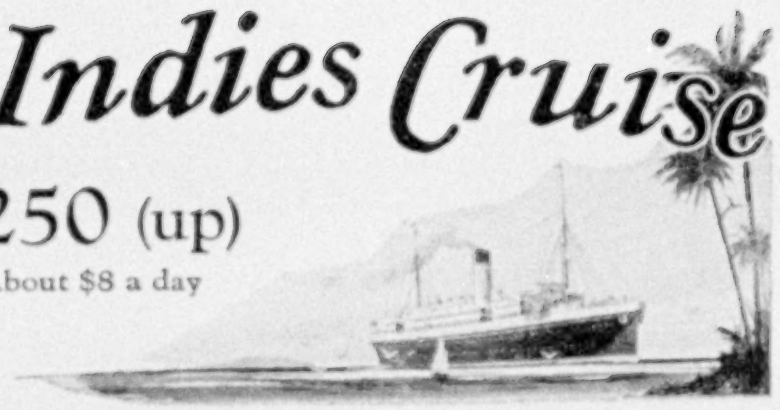
You can't be too careful of your teeth. "Wash" them after every meal and before retiring with Colgate's. It is made right and priced right—25c. for the large tube at your favorite store.


A gift that will recall this Christmas throughout a whole life-time of usefulness and enjoyment– – –
Zeiss Binoculars are sold by leading opticians, camera- and sporting-goods stores. Write for catalog of 22 models of 3 to 18 power.
HAROLD M. BENNETT U. S. AGT. 153-D WEST 23 ST., NEW YORK
ZEISS
Prism Binoculars
CARL ZEISS JENA

West Indies Cruise

$250 (up)

About $8 a day



Sail away—to Health and Gay Adventure

A letter-piled desk, a jangling telephone, the buzz and hum of busy voices. What a strain! And how vital it is to get away from it all for a few weeks of adventuring!

This one-month cruise to the West Indies, the Panama Canal and northern coast of South America, is planned for busy men and women. It will give them time to breathe —give them relaxation and stimulation—and still not keep them too long away from home.

White Star Liner *MEGANTIC*
sails Jan. 23 and Feb. 27
30 days–31 days

The *Megantic* is a splendid ship, constructed specially for cruising in southern waters and is operated by a line with over 25 years actual cruising experience in the West Indies.

Fill in the coupon at the left for the illustrated booklet that describes this cruise.

WHITE STAR LINE, No. 1 Broadway, New York City.
Please send me the West Indies Cruise literature.

Name _____

Street Address _____

City _____ N-2

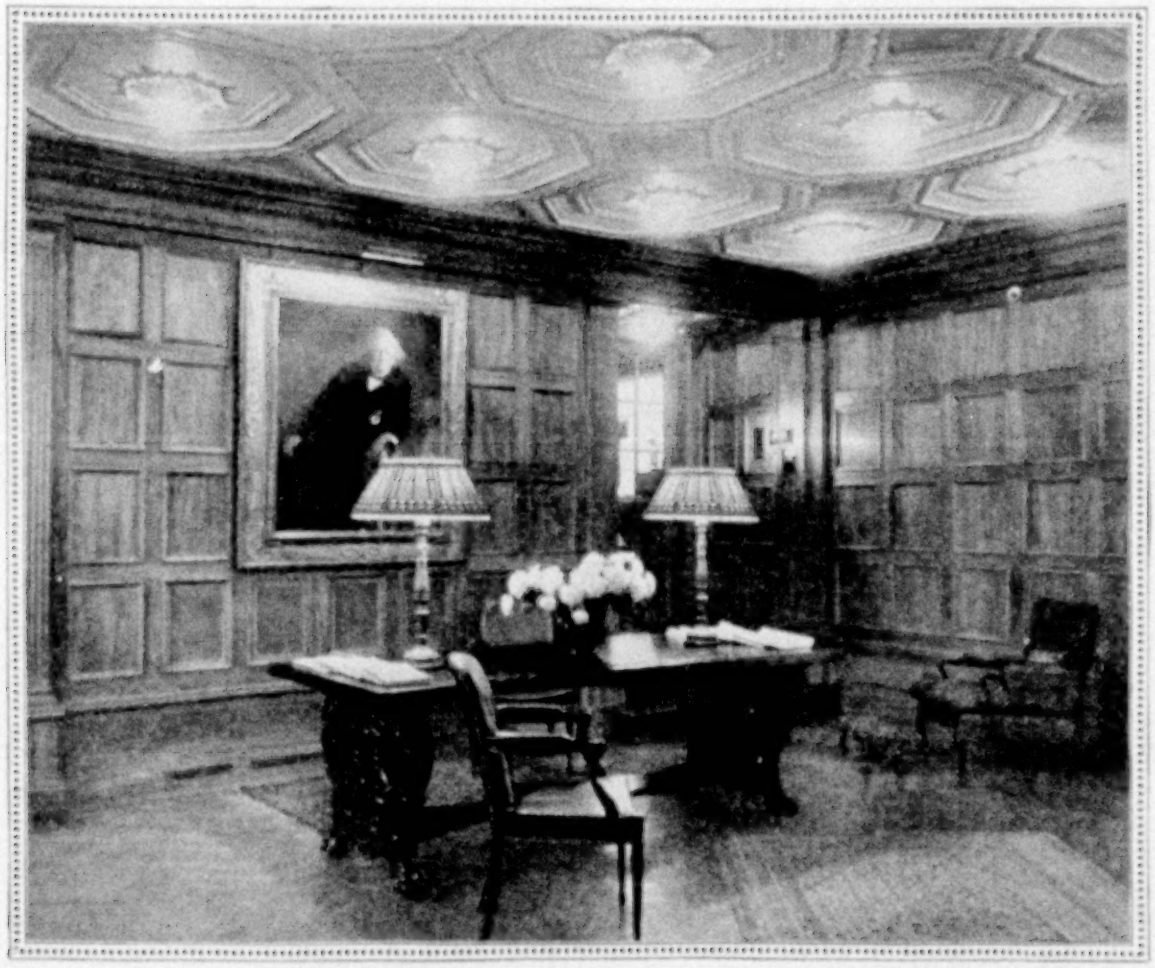
Passengers from Florida may join the cruise at Havana and may leave at Nassau on return.

IMM

WHITE STAR LINE
No. 1 Broadway, New York City

GUMWOOD—ONE OF AMERICA'S FINEST CABINET HARDWOODS

Nature propounds a riddle. Figured gumwood follows no law. Its patterns are always individual and different—a fascinating study in Nature's handiwork.



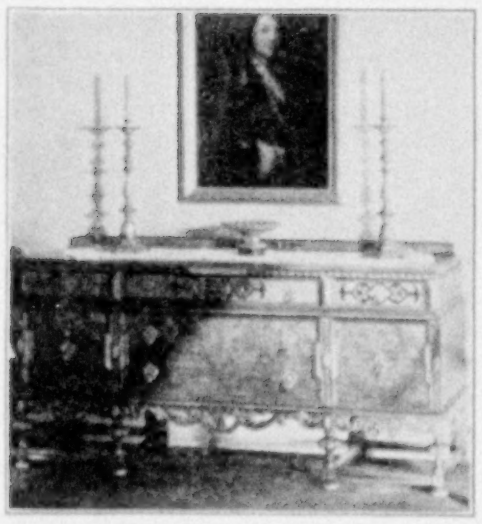
The delicate ribbon-like effect of figured gumwood panels, with plainer gumwood surrounding them, is a decorative triumph in this dignified library.

Reveals the Beauty of Gumwood

—for good furniture and good interior woodwork

FORTUNATE indeed is the home that possesses paneling and other woodwork fabricated from this beautiful and distinctive hardwood. An elusive warmth of tone in the natural reddish-brown coloration suffuses itself through any finish applied. The effect is very delicate, further emphasized by a satin-like sheen peculiar to this wood.

Figured gumwood, ranging from highly ornate to soft and unobtrusive ribbon-like effects, may be used with plainer panels to provide a rich decorative element. No cabinet wood offers more interesting possibilities.

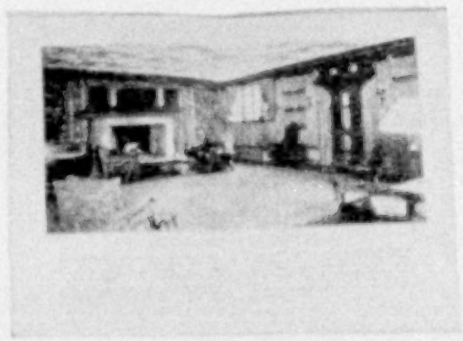


Entire carved base, legs, and solid parts are Gumwood, in connection with other cabinet woods used for ornamental surfaces.

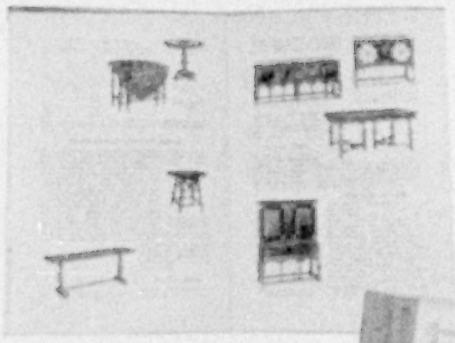
Trust the Maker

More actual value may be put into design, ornamental wood surfaces, and permanent construction of good furniture, when gumwood is suitably used for solid parts. Craftsmen who know the properties of woods endorse gumwood. Leading retail furniture dealers will gladly point out its many advantages.

For further information, write The Gumwood Service Bureau of the Hardwood Manufacturers Institute, Memphis, Tenn.

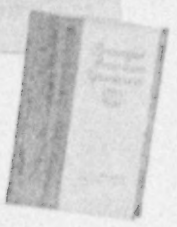


COLOR PLATES illustrate beautiful Gumwood finishes. 24 pages, free on request.



GUMWOOD SERVICE BUREAU
Bank of Commerce Bldg.,
Memphis, Tenn.

Please send me your booklet—
"BEAUTIFUL AMERICAN GUMWOOD"



Name .....

Address .....

City ..... *State* .....

There are two ways of keeping fine clothes fine. One is not to travel. The other is to travel—with an Oshkosh Wardrobe Trunk.

An attractive booklet describing Oshkosh Trunks will be sent you on request to 467 High Street, Oshkosh, Wisconsin.

OSHKOSH

THE OSHKOSH TRUNK COMPANY
Oshkosh, Wisconsin, and New York City

hawaii

Where Don Juan Gaetano planted the Standard of Spain

IN the days when the Dons of Spain sailed the Seven Seas it is said that Don Juan Gaetano discovered Hawaii. After months of voyaging he came to these isles of untold beauty, abounding with fruits of indescribable delicacy, and inhabitated by a gentle, cultured people — hospitable and peace-loving.

Only five and one-half days on a perfectly equipped Matson liner and the Islands that struck the Spanish Dons with wonder are yours! Here is a holiday of incomparable pleasure. The unique, almost indescribable charm of Hawaii, the combined atmosphere of the Orient and the Tropics.

You land at Honolulu—the gateway to these mystical latitudes of delight. From then until you sail away with "Aloha Oe," the most plaintive and tenderest melody in the world, floating up to voyagers literally covered with flowers, you have only to enjoy to the utmost the exquisite hospitality of the gayest, loveliest, most fascinating of the Pacific island groups. The minimum cost for the tour is about $270.

This land of enchantment is within your reach. Every week one of these luxurious Matson liners sails from San Francisco [from Seattle every forty-two days] for Hawaii.

The new Matson ship, the MALOLO *(Flying Fish), now under construction, will be completed early in 1927. She will contain more private baths than any other ship afloat. The vessel will cost over six and a half million dollars and will be designed as a naval auxiliary cruiser.*

matson
navigation Company

Matson Navigation Co.,
211 Market St., San Francisco
I am interested in a trip to Hawaii.
Please send me particulars.

Name Address

Literature has been prepared especially for use in schools. If you desire it, check here. [ ]

An airplane view of a portion of Oak Park, Illinois, where you hear the word "oilomatic"—but never "oil burner"

The largest village in the world
puts its approval on Oil-O-Matic

ABOUT 10 miles west of Chicago lies the village of Oak Park. Fifty-five thousand good American citizens have staunchly defended her villagehood against any and all attempts at incorporation. The character of the residences and the wealth in this world's largest village is reflected in the income tax returns. Four times as many paid this tax as the average for the United States.

Naturally this garden spot is a mecca for oil burner companies. Practically all of the larger concerns are vigorously represented there. It is significant that in the last two years four Oil-O-Matics have been installed to one of any other make of oil burner. As you walk along the streets of Oak Park you often hear the word "oilomatic"—but never "oil burner"! For Oak Park has found that oil heat in the sense you would like to know it, is really Oil-O-Matic and can be nothing else.

In such homes the furnishings must be kept immaculate. No noise is tolerated. Health is paramount. Heat must be generous and at the same time, entirely automatic. Maids cannot be expected to double as firemen.

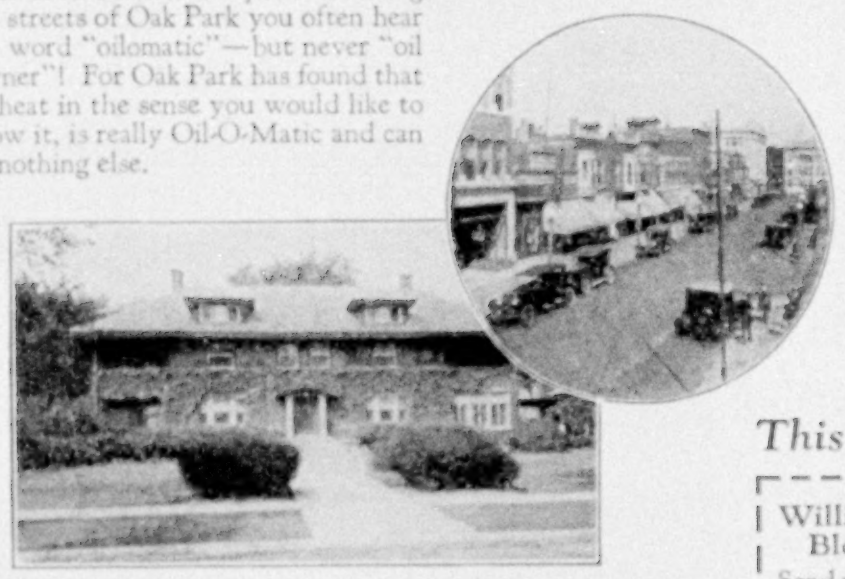
In every city where fine homes predominate, Oil-O-Matic is the favored oil burner. In fact, the finer the homes the more insistent are the owners upon this one kind of oil heat.

It is almost paradoxical, that the burner selected by people of means is the one in which cost of operation is lowest. Oil-O-Matic is the oil burner the Underwriters' Laboratories list as standard to burn fuel oil. This grade of oil according to established tables contains more heat units per gallon than any other lighter oil and costs less per gallon.

There are no heating conditions in your house, that are not being successfully met in thousands of others. For nearly seven years Oil-O-Matic has demonstrated the soundness of the four natural laws of oil combustion. Whether you have a steam, hot water, vapor or hot air system, Oil-O-Matic can be used to distinct advantage.

Tens of thousands of Oil-O-Matic owners throughout the country are enjoying a degree of comfort and convenience once restricted to luxurious hotel life. The Oil-O-Matic heating expert in your community can install your burner now without apparent interruption in household comfort. You may extend the payments over a year if you prefer.

Love of personal comfort and regard for your family suggests that you send for all the facts. A library edition of "New Facts About Oil Heating" is ready. We will send it free and postpaid for the return of the coupon below together with special plans for better use of your basement space.



Typical of the homes that grace Oak Park, is this lovely place on Euclid Ave. In the circle above are shown six shops on Marian Street heated by Oil-O-Matic

WILLIAMS
OIL-O-MATIC
HEATING

This Coupon Brings the Book Free

Williams Oil-O-Matic Heating Corp.
Bloomington, Ill. NG 1225

Send me FREE and POSTPAID your library edition of "New Facts About Oil Heating" and plans for ideal arrangement of basement space.

Name.....

Address.....

Our heating plant is—

☐ Steam ☐ Hot Water ☐ Hot Air

"The Sunshine Belt to the Orient"

Here

Adventure

fills each day with rare and delightful activity

The colorful beauty of Hawaii. The keen progressiveness of Japan. Age-old China. The charm and mysticism of India.

What weeks of unceasing interest these lands promise! All are worthy of a visit, even though it cannot be long. All reward wanderers with unforgettable memories.

There are other lands, too, which are just as alluring. The Philippines, Malaya, Ceylon and Egypt have all inspired famous story-tellers to set down their weird tales.

Treasures

But the beauty, the color, the people and the scenes are only a part of your adventure.

There are quaint shops in which you find priceless treasures.

Jewels and precious stones, lovely filigrees, of silver and gold, choice ivories, heavy silks and brocades, batiks and rare furniture are to be bargained for and forever enjoyed.

The entire trip is an unforgettable memory. And you go in comfort such as you have always thought you could find in this country and Europe alone.

Magnificent Liners

Every Saturday a palatial President Liner departs from San Francisco for the Orient and Round the World. It is spacious, luxurious and wonderfully served.

It calls at Hawaii, Japan, China, the Philippines, Malaya, Ceylon, India, Egypt, Italy, France, Boston, New York, Havana, Panama and Los Angeles.

In addition, there is a fortnightly service from Boston and New York for California, the Orient and Round the World via Havana and Panama.

For complete information relative to this finest service communicate with any ticket or tourist agent or with one of the United States or foreign offices of the

DOLLAR
STEAMSHIP LINE

604 Fifth Avenue, New York City
112 West Adams Street, Chicago, Ill.
177 State Street, Boston, Mass.
101 Bourse Building, Philadelphia, Pa.
626 So. Spring Street, Los Angeles, Calif.

Hugh Mackenzie, G. P. A.
Robert Dollar Building,
San Francisco, California

Ship from the Center—not the Rim

THE needs of modern business have caused a well-defined movement of industries toward the center of the country. It brings manufacturers closer to their customers and nearer their raw material supply. Eastern manufacturers whose markets have moved away from them feel the effect of this westward trend of industry.

This is one of the reasons why 156 new industries have located in St. Louis in the last five years. St. Louis has approximately 3,500 factories in 211 different lines of business. It is a city of diversified industry, which makes it strong in time of business depressions. It is near the great raw material districts, and has facilities for economical distribution to all markets.

A factory in St. Louis reaches two-thirds of the United States with a shorter freight haul and at lower cost than those of any other great industrial city. St. Louis manufacturers Ship From the Center—Not the Rim.

Write for this Booklet

Our illustrated booklet, "The New St. Louis," tells the story more completely. It gives facts, figures and pictures about St. Louis.

Address Department 15

ST. LOUIS CHAMBER of COMMERCE
St. Louis, U. S. A.

From Strength to Strength Advancing!

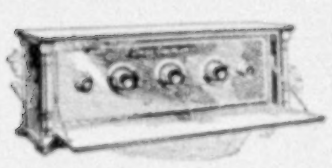
ACHIEVEMENT is all conquering. With banners flying, it sweeps triumphantly to fame. The advance of FREED-EISEMANN has been irresistible. Last year the overwhelming preference of the public made FREED-EISEMANN the world's largest makers of Neutrodyne Radio. This season the continued demand for FREED-EISEMANN has been so great that all sales records have been broken and the leadership of FREED-EISEMANN still further confirmed.

The American public has made known its preference—you are safe in making that preference your choice. Choose the FREED-EISEMANN!

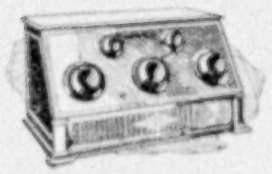
WITHOUT cost or obligation—
a liberal home trial

Our dealers are so sure of the performance of the FREED-EISEMANN that *this week* they will gladly install a set in your home *without obligation.* Phone your neighborhood dealer.

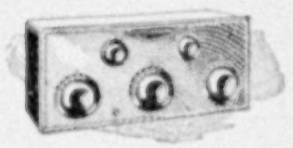
Freed-Eisemann Radio Corporation
MANHATTAN BRIDGE PLAZA, BROOKLYN, N. Y.



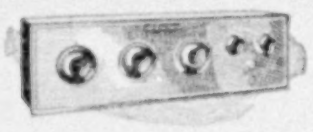
NEW! NR-45 $160.00
A de luxe six-tube Neutrodyne receiver, remarkably selective, in handsome cabinet*



NEW! FE-18 $90.00
†*A new five-tube dry cell receiver; space for batteries in cabinet*



NEW! FE-15 $75.00
†*A new five-tube receiver built for use with storage battery*



NEW! NR-7 $110.00
A six-tube licensed Neutrodyne receiver embodying an improved method of audio-frequency amplification*

†Licensed and manufactured under a group of Latour patents.
*Licensed by Independent Radio Mfrs., Inc., under Hazeltine patents Nos. 1450080, 1489228, 1533858.

FREED-EISEMANN

World's Largest Makers of Neutrodyne Radio

Unique in its atmosphere

Golden State *Limited*

California

Rock Island — Southern Pacific Lines

The luxurious and congenial environment of an ocean liner translated to railroad travel.

From Chicago, St. Louis and Kansas City direct to Los Angeles, Santa Barbara and San Diego. 68 hours of luxury. No extra fare.

Rock Island Travel Bureaus in all principal cities.

Mail this →

L. M. ALLEN, Vice President, Rock Island Lines
737 La Salle Street Station, Chicago, Ill.

Please mail me copies of booklets on California and the Golden State Limited.

Name.....

Address.....

.....

HUKI this Winter in

Hawaii

"Huki!" Hawaiian boys shout at Waikiki—"Pull, Pull!" as a great white-capped comber lifts your outrigger canoe and hurls you landward at breath-taking speed.

Try this summery vacation this winter—as unlike the rest of your year as a holiday should be—and as easy to plan and take! Your nearest railway, steamship or travel agent can book you direct to Honolulu. Steady-keeled liners sail from Los Angeles, San Francisco, Seattle, Vancouver or Victoria, B. C., in 5 to 6 days.

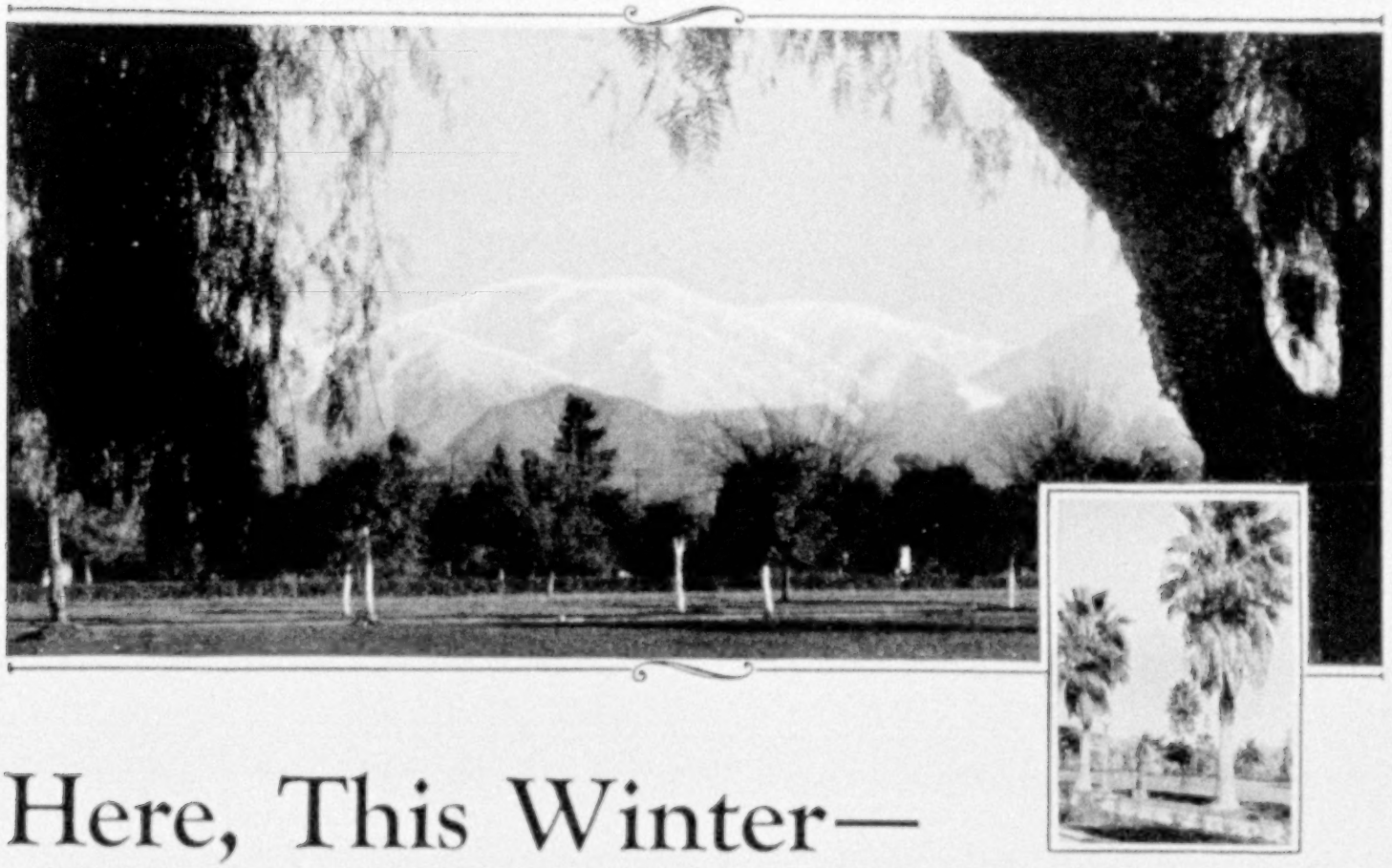
Enjoy Hawaii several weeks or months; living costs are moderate. Or make the round trip from the Pacific Coast in 3 or 4 weeks for as little as $300 or $400, allowing a week or two in Uncle Sam's romantic territory and providing for all travel and living expense.

Good golf, motoring, hotels, modern conveniences, on all larger islands. Tennis, deep-sea fishing, hiking, inter-island cruising; volcanic wonders in Hawaii National Park. If you wish descriptive, colored brochure on Hawaii, write now—

HAWAII TOURIST BUREAU

212 MONADNOCK BLDG., SAN FRANCISCO

341 FORT ST., HONOLULU, HAWAII, U. S. A.



Here, This Winter—

Here, in Southern California, a myriad joys await you—a climate that robs winter of its discomforts, a countryside that smiles with flowers and orange blossoms, a landscape that yields unending scenic inspiration.

WHILE biting winds and icy pavements tell of winter elsewhere, in Southern California there are balmy breezes, green hills, inviting motor roads, sun-warmed gardens, great groves of golden oranges.

Snow and ice are miles away. You'll see them on the mountain tops sparkling in the distance—a wonderful picture, and all the more wonderful because the snow and ice are there for you to *look* at but not to *feel* unless you want to go to them.

All this is but one of the features that makes Southern California different from any other place. It's the kind of difference that you will like, that will refresh you, that will make you glad you came.

Another feature is the *reasonableness* of living here. You'll find resort hotels that rank with the finest in the world, more modest places, too, and apartments, bungalows, and boarding houses, and all the way through you'll discover that rates are low.

Plan now for a visit here this winter, in Los Angeles, or Pasadena, or Santa Barbara, or Riverside. There are dozens of other places you'll wish to see.

Mail coupon below for illustrated booklet or ask your nearest railroad ticket agent for further information.

Buy your ticket to Los Angeles and return by way of Santa Barbara, San Francisco, Portland and Seattle. *See the Great West in one glorious trip.*

Southern California

Year 'Round Vacation Land Supreme

The growth, wealth and marvelous resources of Southern California are indicated by the following facts and figures pertaining to the County of Los Angeles alone:

Value of Agricultural Products (1924)	$82,588,993
Value of Citrus Products (1924)	32,480,685
Harbor Imports (1924)	4,136,799 tons
Harbor Exports (1924)	18,131,622 tons
Total	22,268,421 tons
Oil Production (1924)	120,000,000 bbls.

A producing season of 365 days a year permitting year 'round crops. A wealth of water for ample irrigation and all other purposes.

ALL-YEAR CLUB OF SOUTHERN CALIFORNIA,
Dept. D12, Chamber of Commerce Bldg.,
Los Angeles, California.

I am planning to visit Southern California this winter. Please send me your free booklet about Southern California vacations. Also booklets telling especially of the attractions and opportunities in the counties which I have checked:

☐ *Los Angeles* ☐ *San Bernardino*
☐ *Orange* ☐ *Santa Barbara*
☐ *Riverside* ☐ *Ventura*

NAME .....

STREET .....

CITY ..... STATE .....

South America

Old Market Place
Buenos Aires

FOUR luxurious ships of 21,000 tons displacement—the fleet of the Pan America Line. Everyroomoutside, nearly all with private bath; real beds—not berths. In any of them your voyage to the wonderlands of South America will be a real pleasure.

Sailing every fortnight from New York

S. S. American Legion
S. S. Southern Cross
S. S. Pan America
S. S. Western World

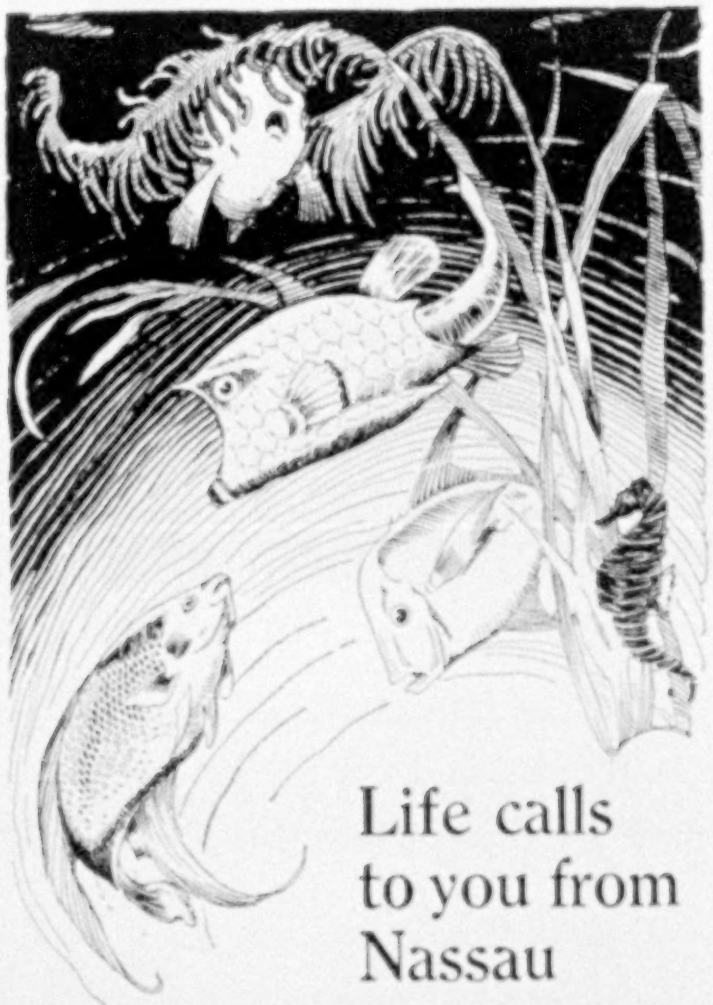
Buenos Aires calls you now at its most delightful season. See this beautiful city—its stately streets, its magnificent race-track.

An endless pageant of scenic beauty awaits you. You'll thrill to fascinating Rio de Janeiro, thriving Santos, gay Montevideo.

Go to South America now. Ask your local Steamship or Tourist Agent or write

PAN AMERICA LINE
MUNSON STEAMSHIP LINE
67 Wall Street, New York

Managing *Operators*



Life calls to you from Nassau

Here Nature sets the stage with all the wonders of the deep—quaint places to see, old forts to explore, dungeons and mysterious caves.

Take a Spring vacation this Winter where the trade winds blow—azure skies, joyous play—bathing, fishing, golf, tennis—peaceful rest at good hotels and boarding places, and the freedom of an English Colony. COME!

2½ days' delightful sail from New York; 15 hours from Florida.

Direct sailings weekly from New York; 3 times weekly from Miami (in season). Write for further information to

Munson S. S. Line, Pass. Dept.,
67 Wall St., New York City

Ward Line, Pass. Dept.,
Pier 13, East River, New York City

Canadian Government
Merchant Marine, Ltd.,
230 St. James St., Montreal

Nassau

"Isle of June"
Bahamas

NASSAU'S BOOK FREE—MAIL THE COUPON

DEVELOPMENT BOARD,
Nassau, "Isle of June," Bahamas

Gentlemen: Send your booklet in colors descriptive of Nassau—"Where Junetime breezes laugh at Winter."

Name.....

Address.....

Here is the most authoritative reference work in the world!

The most delightful record of the romance and wisdom of the ages!

THE NEW LARNED HISTORY

For Ready Reference, Reading, and Research

7,000 years of human history are covered in this great new work *in the actual words of 5,500 famous historians* among whom are the best of the present day. The most valuable parts of 9,783 volumes are included.

Back of *The New Larned* is the broad conception of history as the authentic record of the world's development in all fields of human activity—literary, political, economic, social, religious, scientific. *Nine times out of ten,* when you consult a reference work, it is for that kind of information. *The New Larned* concentrates just that constantly needed information more fully, with greater authority, and with higher literary excellence than any other work. That is why it meets so completely your daily reference needs and your desire for diversion and enlightenment.

What a worthwhile gift for Christmas!

The only great reference work that is new and up to date from cover to cover.

The gripping story, told *in the light of modern research,* of all that has influenced the life of mankind from the dawn of history.

The rich heritage of knowledge accumulated for us during 7,000 years of human progress.

A wealth of notes on biographical, geographical, and general questions of constant usefulness. Nearly 700 original documents of vital interest. Many fine illustrations.

A reference work compiled under a new system that makes every point of this great store of information instantly accessible.

A liberal education in 12 volumes that will enable its possessor to acquire gradually the knowledge that is most practical and useful in understanding present-day events and conditions.

Send to-day for your FREE copy of this 96-page illustrated book

with specimen pages and many illustrations from *The New Larned* and full information.

MAIL THIS COUPON

C. A. NICHOLS PUBLISHING CO., *Est. 1851,* Springfield, Mass.

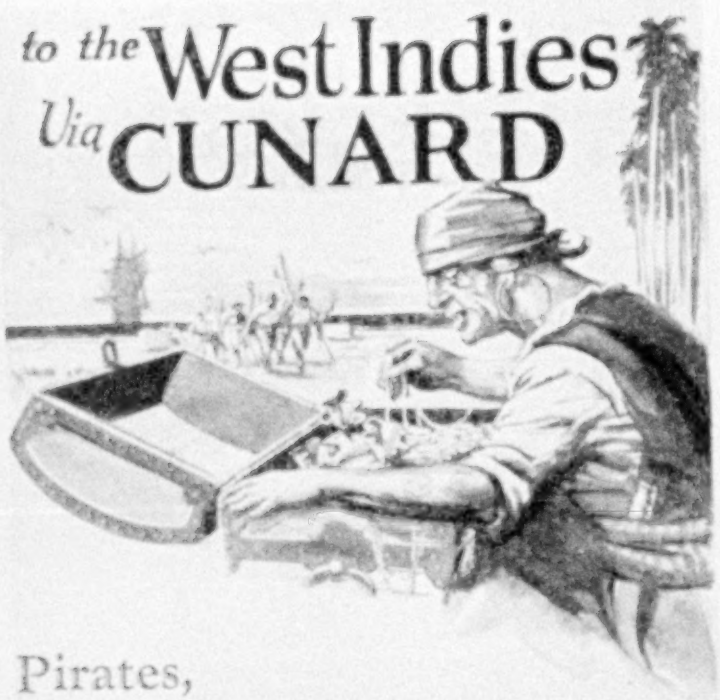
Please send me, without cost or obligation, a copy of your new 96-page booklet describing *The New Larned History,* with specimen pages, illustrations, and full information.

(Geographic 12-25)

*Name*_____

*Street Address*_____ *City and State*_____

to the West Indies Via CUNARD



Pirates, Pieces of Eight, Galleons Freighted with Gold!

All the glamor and romance with which tales of the Spanish Main are filled, greets the traveler cruising among the palm-fringed islands of the Caribbean.

Our magnificent new steamer

"CALIFORNIA"

replete with every comfort-feature; electric fans in every room and a unique thermo-tank ventilation system, offers two wonderful opportunities for such a cruise, and will sail from New York

Jan. 23 and Feb. 25, 1926

A most interesting 30-day itinerary covering *Havana, Port au Prince, Kingston, Colon, Cartagena, La Guayra, Port of Spain, Barbados, Martinique, Fort de France, St. Pierre, St. Thomas, San Juan, Nassau, Bermuda.* Comprehensive sightseeing tours ashore under the direction of *Thos. Cook & Son.*

Cunard Service and Cuisine

apply

CUNARD

AND **ANCHOR** *LINES*

25 Broadway, New York
or Branches and Agencies

PROOF

Your best and surest proof of the soundness and quality of Straus Bonds is their past record—43 years without loss and without delay in payment of principal and interest when due.

Investors seeking safety, the best interest rate consistent with safety, a satisfactory market which is steadily broadening, and wide diversification, should investigate Straus Bonds. Write today for

BOOKLET L-1508

S.W. STRAUS & CO.

Established 1882 ▪ Investment Bonds ▪ Incorporated

STRAUS BUILDING
565 Fifth Avenue
at 46th St.
NEW YORK

STRAUS BUILDING
Michigan Avenue
at Jackson Blvd.
CHICAGO

43 YEARS WITHOUT LOSS TO ANY INVESTOR

© 1925—S. W. S. & Co., Inc.

Keeping Your Capital in the Nation's Capital

IS MADE EASY BY OUR SYSTEM OF

"BANKING-BY-MAIL"

Booklet mailed on request

3% *on Savings Deposits*
2% *on Check Accounts*

The Washington Loan & Trust Company

WASHINGTON, D. C.

JOHN B. LARNER, *President*
JOHN JOY EDSON, *Chairman of the Board*

Capital, Surplus and Undivided Profits over Three Million Dollars

Giving Good Gifts

WHAT a lovely thing it is—the Christmas spirit—that prompts men and women to forget self and open hearts and purses that others may be made happy. But sometimes that very spirit—beautiful as it is—sweeps one into gift-giving which is embarrassing. In our efforts to spread gladness as far as we can, we frequently send gifts to those who have much "gold, frankincense and myrrh" and would appreciate a kindly Christmas thought more than an expensive gift.

When well and happy we are apt to forget the sick and suffering and needy—men and women and little children to whom Christmas has brought nothing but heartbreak and hopes denied, whose lives, drab at best, are made even more dreary by contrast with the gladness and cheer of the Yuletide season.

At the Wayside

In a beautiful Christmas story, we read of a Fourth Wise Man who was turned from his high purpose of bearing offerings to the new-born King by a compelling impulse to help the suffering at the wayside. Yet in the end was his honor all the greater. The allegory is plain:—the worthy desire to give costly gifts to those we love should not keep us from helping the unfriended and the needy.

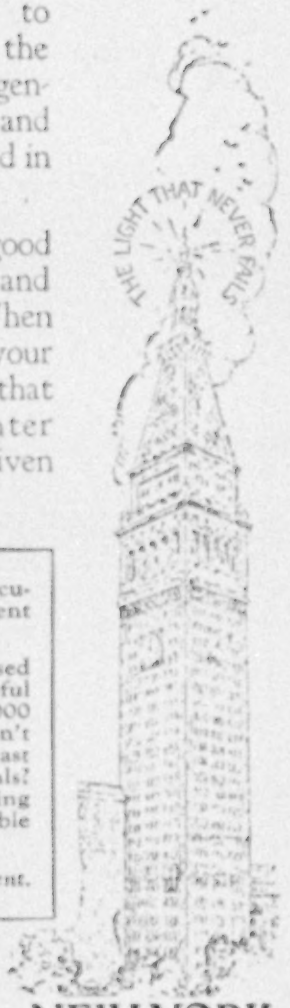
Try a New Plan this Year

This Christmas, give good gifts—not as custom dictates, but as your heart prompts. Give lavishly as your means will permit. Give to those you love and those to whom your gift will bring gladness. Give as far and as widely as you can. But in your giving set apart something—a little or much—for those who are in *need* of Christmas gifts. It is not necessary to have a great deal of money to extend your gift-giving beyond your immediate circle. Perhaps you can spare only a dollar, or a twenty-five-cent piece, or a dime.

Give Wisely

If you do not know any unfortunate families who need your help, or if you feel that the amount you can give is too small to be of use, give to one of the many well-organized relief and welfare societies. They are in a position to investigate needy cases and will use your money to do the greatest amount of good. They supply warm clothing, they furnish nourishing dinners and distribute toys to eager youngsters who have written confidingly to Santa Claus. It is impossible to calculate the good which these charitable agencies do in giving new hope and cheer to those sick in spirit and in body. They need your help.

—This Christmas, give good gifts—the gifts of happiness and cheer and encouragement. When you are making merry around your tree know the joy of feeling that others are having a brighter Christmas because you have given from your heart.



You who are well and happy this Christmas—who are looking forward to a day of gladness spent with your dear ones—won't you help spread cheer and comfort among those stricken with Tuberculosis?

All over the world today are thousands and thousands of sufferers from Tuberculosis. In this country alone it is estimated that there are 1,000,000 men, women and children afflicted with this dread disease.

Christmas Seals help to support more than 600 hospitals and sanatoria, with nearly 70,000 beds; more than 600 clinics and dispensaries; 3,000 open-air schools, fresh air classes and outdoor camps for children predisposed to Tuberculosis; 10,000 nurses who are giving treatment and health instructions.

The cheery little Christmas Seals which are used to fight Tuberculosis offer an instance of useful giving. Whether your income is $50,000, $5,000 or $500 a year—here is a way to help. Won't you do this simple, gracious thing—buy at least a dollar's or a dime's worth of Christmas Seals? They cost only a penny apiece. Others, seeing your Seals may be reminded to join in the noble work of fighting the Great White Plague.

HALEY FISKE, *President.*

Published by

METROPOLITAN LIFE INSURANCE COMPANY—NEW YORK

Biggest in the World, More Assets, More Policyholders, More Insurance in force, More new Insurance each year

This Christmas give Whitman's

Not merely good candy but joyous, bright packages that speak the language of sentiment. The spirit of Christmas expressed in *the gift universal*—candy. There's a Whitman package, and assortment, suited to every taste.

Consider the Sampler with bright Yule-tide outer wrap of sampler cross-stitch design. See the seductive Pleasure Island package enclosed, for Christmas, in a Pirate's Chest.

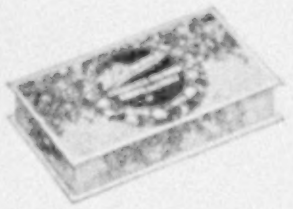
Study the beauties of the Cloisonné Package, a metal box of real cloisonné design compact with selected chocolates. Admire the art study by Franklin Booth on the new package of Bonnybrook Milk Chocolates, a new Whitman assortment. Observe the bright bands on the Standard and other packages—a little touch of Christmas cheer.

Think of all who would enjoy the Fussy Package, Fruits and Nuts, Salmagundi, Old Time Favorites, and the children who would delight in the Wonderbox.

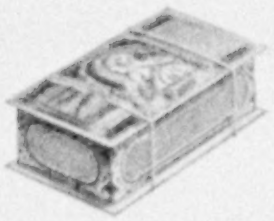
The Whitman agency near you gets every package *direct from Whitman's not through a jobber.* Write for booklet "On Choosing Chocolates" and folder illustrating the beautiful Whitman fancy boxes and baskets for Christmas gift-giving.

STEPHEN F. WHITMAN & SON, Inc., Philadelphia, U. S. A.
New York Chicago San Francisco

A FUSSY PACKAGE—Nuts and nut combinations in chocolates



CHOCOLATE COVERED FRUITS AND NUTS—A luxury package



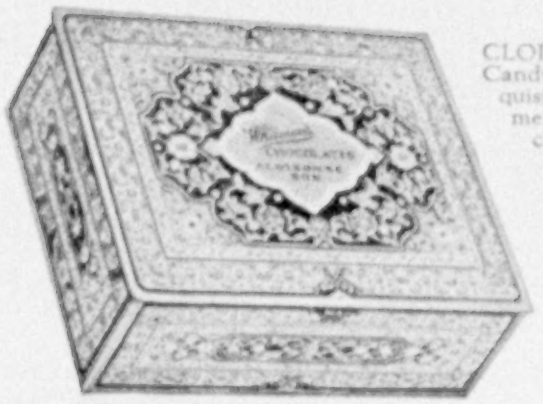
SALMAGUNDI—A new assortment of chocolates in artistic metal box

NUTS CHOCOLATE COVERED—Whole nut meats, heavily coated

PLEASURE ISLAND—Chocolates in a package suggestive of romance and adventure. Can also be had in this outer "sea-chest"

BONNYBROOK MILK CHOCOLATES—One of the newest Whitman packages—certain to please

WONDERBOX—Selected barley sugar shapes and plain sweet chocolate for children



CLOISONNÉ BOX—Candy gift de luxe—exquisitely decorated metal box. 3½ lbs. chocolates. $5

STANDARD CHOCOLATES—Famous since 1842. With special "Merry Christmas" band

VOL. XLVIII, No. 6 WASHINGTON DECEMBER, 1925

THE NATIONAL GEOGRAPHIC MAGAZINE

COPYRIGHT 1925, BY NATIONAL GEOGRAPHIC SOCIETY, WASHINGTON, D. C., IN THE UNITED STATES AND GREAT BRITAIN

THE TAURINE WORLD

Cattle and Their Place in the Human Scheme—Wild Types and Modern Breeds in Many Lands

BY ALVIN HOWARD SANDERS, D. AGR., LL. D.

EDITOR "THE BREEDER'S GAZETTE," AUTHOR OF "THE STORY OF THE HEREFORDS," "SHORTHORN CATTLE," "A HISTORY OF THE PERCHERON HORSE," "AT THE SIGN OF THE STOCK YARD INN," ETC.

With Illustrations in Color from Portraits Painted from Life by Edward Herbert Miner

WE are accustomed to think of cattle as merely the source of the milk and cream, the butter and cheese, the roasts and steaks, that enter so extensively into the human dietary, in all except the torrid zones of the earth. Few of us stop to consider, in connection with the part played by man's most valuable friend in the animal kingdom, that the actual contribution of cattle to human needs by no means begins and ends with the foods that make up so much of our commissary.

Once upon a time thousands of cattle were raised and slaughtered on the pampas of Argentina, as well as on the coastal plains of the Gulf of Mexico and seaboard California, solely for their hides and horns!

In those then-remote parts there was no market for either beef or milk because there was neither refrigeration nor adequate transportation. Now, all that is changed; and yet, in the very heart of our richest agricultural States, where every consideration demands a better beast, one may see in almost every community, and in every central stockyard market place, cattle that yield about as much leather, glue, tankage, bone meal, buttons, and toothbrush handles as they do of edible products.

This fact accounts in great measure for the existing high development of the huge American packing-house industry. Everything—good, bad, and indifferent—is grist that enters the packer's mill.

NOT ALL CATTLE LIVE UP TO THEIR PICTURES

As we drive up and down the highways and byways of our country we may observe here and there, in roadside pastures, cattle that bear close resemblance to the color illustrations in these pages, and at the great cattle shows—East, West, North, and South—one will easily recognize, after a study of these plates, the Shorthorn (the "Durham" of our fathers), the Hereford, the black, hornless Aberdeen-Angus, the Jersey, the Guernsey, the Holstein-Friesian, and other improved varieties.

Notwithstanding the easy availability of all these highly specialized bovine types, however, it must be acknowledged that average cattle are of inferior quality, in spite of all the efforts of the Government,

© H. Armstrong Roberts

A FRIEND OF THE COW

There is no food so valuable for young children as milk and its products. It contains all of the body-building elements essential to their growth and development.

the agricultural colleges, the livestock press, and others interested in supplanting the plain, everyday "scrub," or native cow, with something infinitely better adapted to the profitable production of high-grade beef and dairy goods for human food.

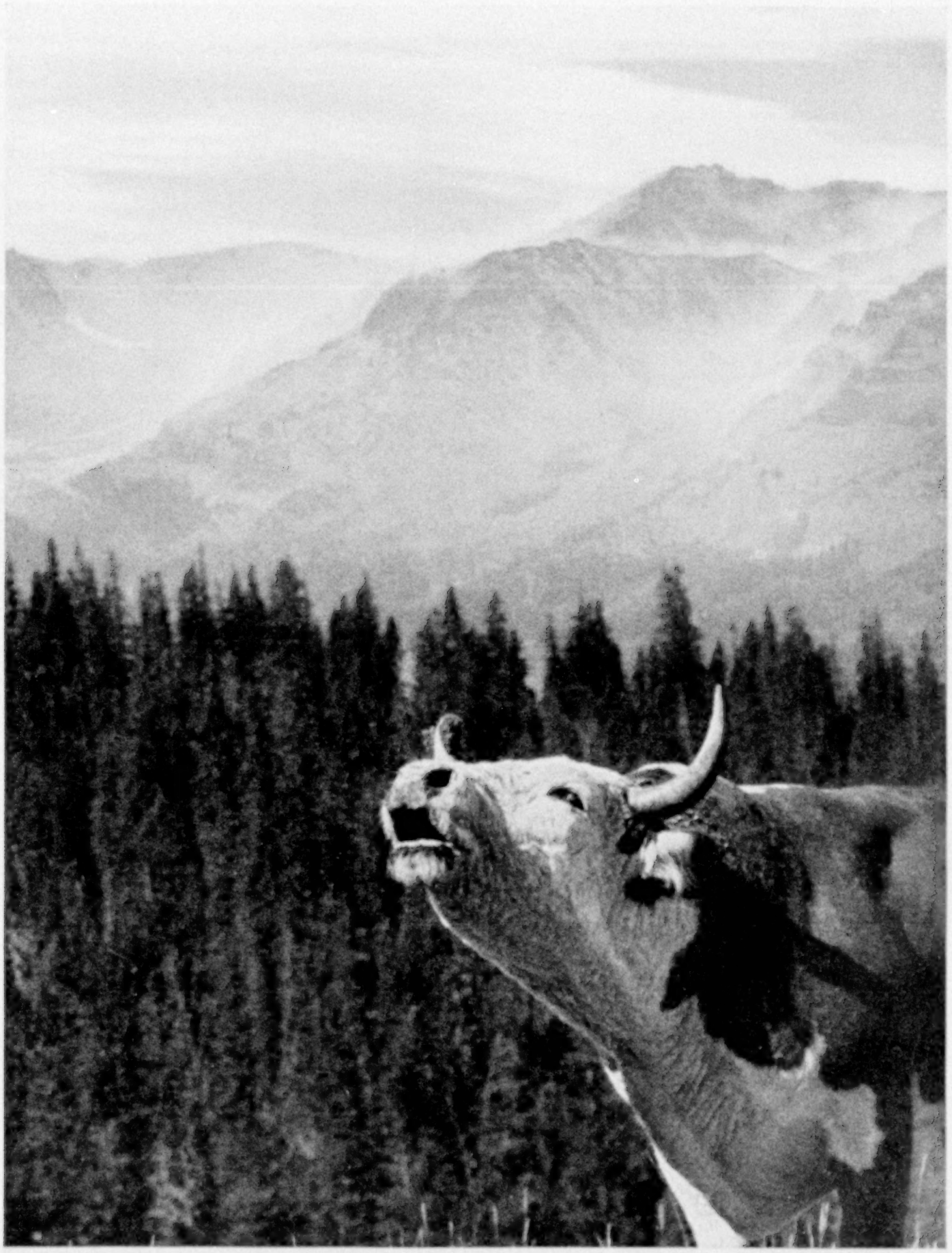
CATTLE PRODUCE MANY SIDE LINES

Forgetting for the moment the food that patient cattle put upon our tables, let us consider other products which are being fabricated through all those days and nights afield for our comfort and our arts and industries. A cow has a hide. On that hide is hair. There is use even for the "switch" swinging at the end of the tail. Ask upholsterers, furniture and mattress makers as to that. Probably there is some of it in the cushions of your motor seat, as you protest against stray cattle standing in the roadway.

And cows have ears. Inside the ear a fine hair grows. This the packer carefully clips out, sorts into little bundles, and the product finds itself presently masquerading as a "camel's-hair" brush with which artists may, perchance, paint bovine pictures!

From the hide is made the leather out of which the suitcase you carried around Europe last summer was manufactured; likewise the handbag, your pocketbook, your boots and shoes. Then, too, there is the gear with which the horses of the world are harnessed, and a good percentage of the belting which turns myriad wheels.

Horns and hoofs! One holds a product of the former in his hand whenever an umbrella or walking stick of a certain fashion is carried. Combs, hairpins, barrettes, buttons, and knife-handles also are made from horn, while pipestems, powder-puff tips, crochet needles, and tiles with which one plays Mah-Jongg come from the bones of cattle as well as from the tusks of elephants. When ground into meal, these same bones feed our



© Charles J. Belden

THE CALL OF THE WESTERN WILD

The instincts of his wild ancestors sometimes assert themselves so vigorously that the range bull bellows forth a challenge to the world.

© Albert Schlechten

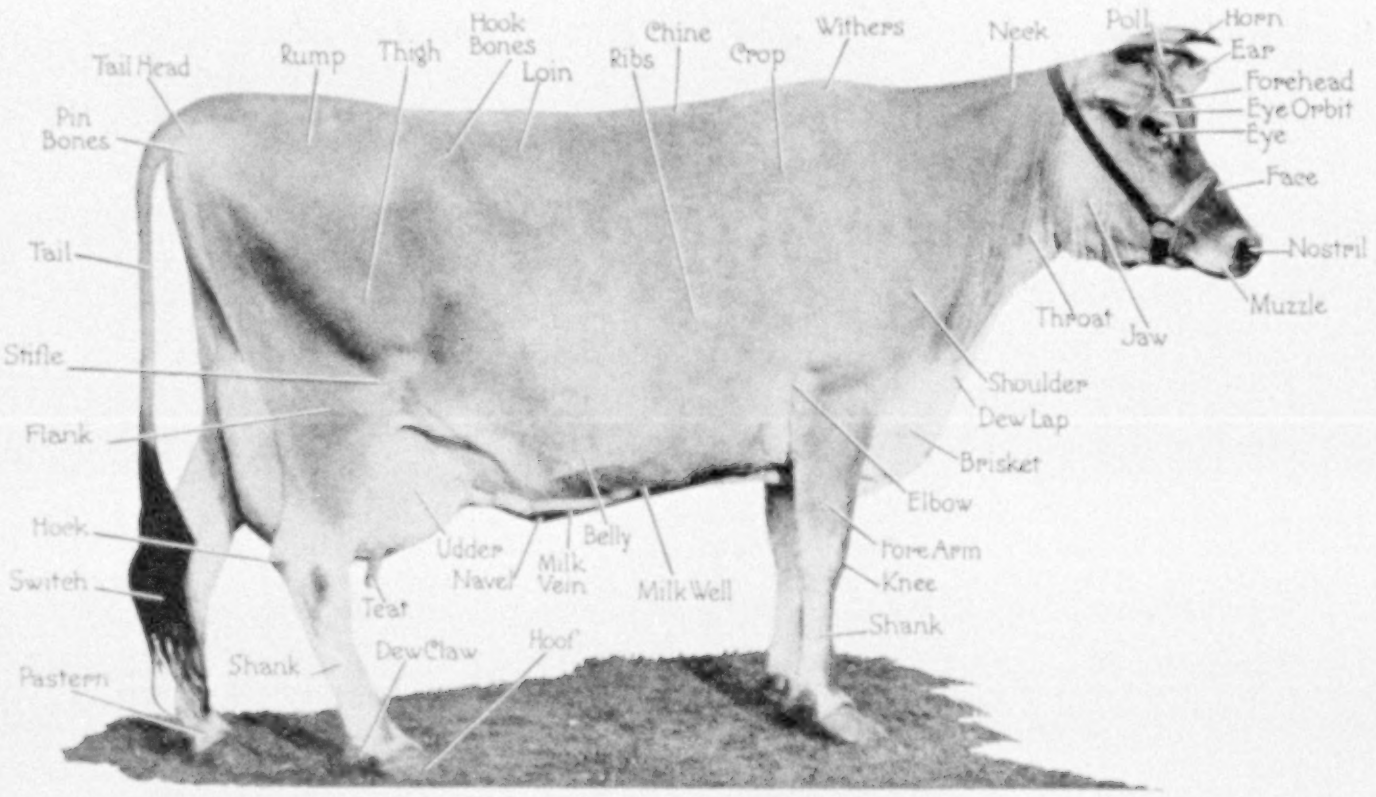
"THE CATTLE UPON A THOUSAND HILLS": A FAR-FLUNG HERD ON A MONTANA RANCH

These cattle are emerging from their winter quarters into the spring sunshine and are spreading over plain and mountain slope in a search for the most succulent patches of pasturage in the vicinity of Bozeman. The United States, with 65,000,000 head, leads the world in aggregate value of cattle (see text, page 597).

Photograph by Charles J. Belden

A WINTRY DAY IN THE SAGEBRUSH COUNTRY

Cattle supposedly find their winter food on this part of the range, but sometimes a cold snap immediately following a snowstorm will cause a hard crust to form on the snow, rendering it impossible for them to break through to the grass beneath. At such times provident ranchmen draw upon their supply of hay.



THE NOMENCLATURE OF THE DAIRY COW

lawns and pastures, thickening and invigorating the grass from which they were originally produced, and, when converted into charcoal, make a filter used in refining sugar.

Glue and soaps, candles, cosmetics, oleomargarine, and glycerin, tankage, bloodmeal, and the trainloads of commercial fertilizer that feed the land and make tillage and trucking possible upon many otherwise sterile soils, likewise come in large measure from cattle.

In the stomachs of "veals" is found the curdling ferment known as rennet, used by pharmacists and a prime necessity in cheese-making; from a tiny gland upon the surface of the brain of cattle we derive an extract, valued in medicinal preparations, known as "pineal substance." Unfortunately, there is in each animal but one pineal, of the size of a pea; so that it takes 15,000 cattle to produce one pound of product!

Science has also contrived to fashion a substantial list of manufactured articles from milk, of which casein is the chief nitrogenous element. It is the "curd," the first and principal use of which is for making the cheese so rich in nutrients; but this same casein is also an ingredient in the manufacture of telephone receivers, combs, fan handles, cigarette holders, and various other articles in daily use. It is also an important constituent of the coating for the paper on which the NATIONAL GEOGRAPHIC MAGAZINE is printed and which is in part responsible for the high quality of its illustrations.

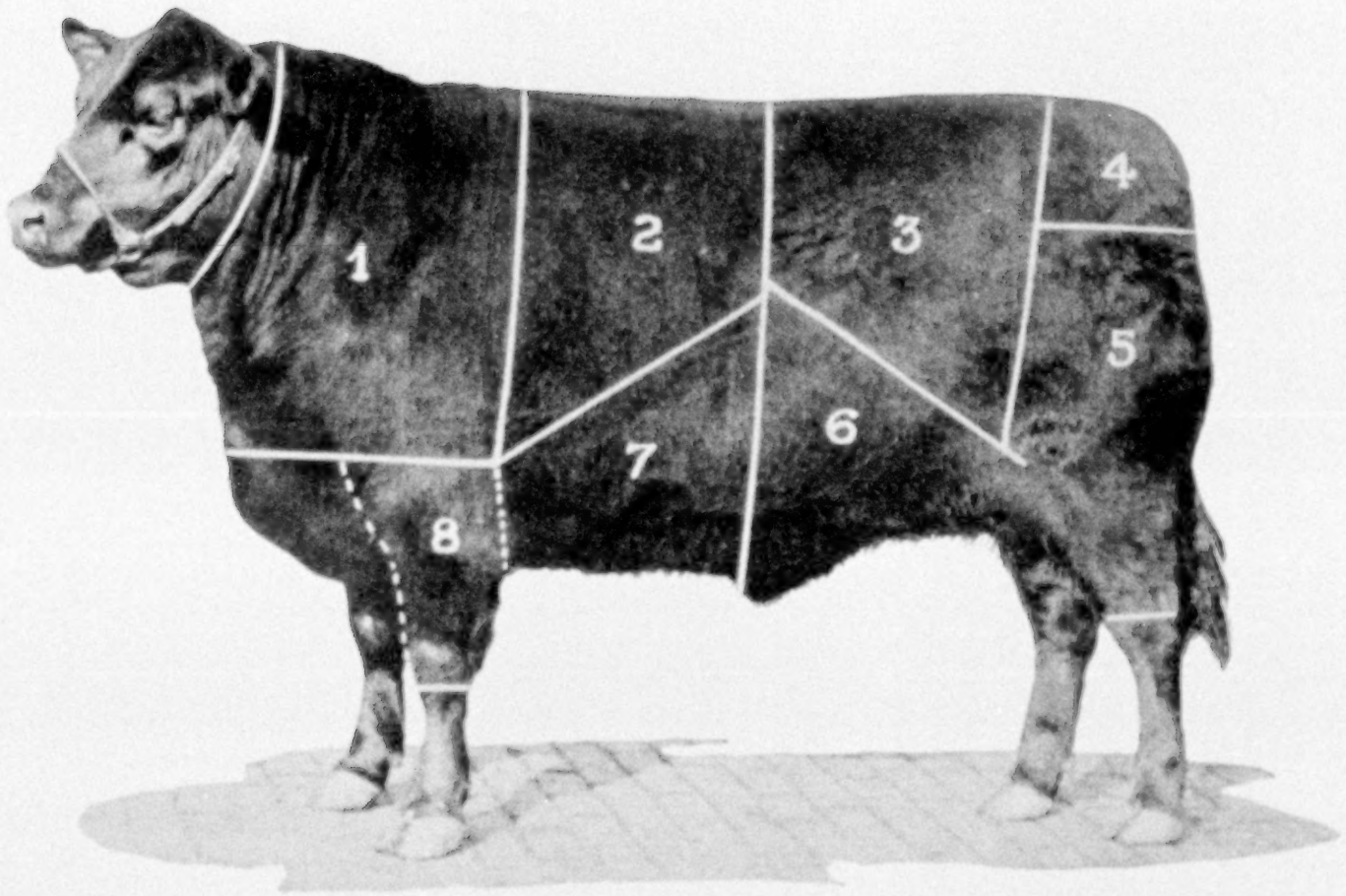
WHY A COW CHEWS HER "CUD"

Is it any wonder such a benefactor of mankind chews her cud with infinite complacency?

The cow, the camel, the bison, and the buffalo; the yak, the deer and elk and antelope, the sheep and the goat all have the cud-chewing habit; and while so indulging themselves are apparently at peace with the world.

This habit is formed as soon as the young begin eating roughage or solids of any kind, hay and grain being offered to calves after they are 10 days old. These foods are first received unchewed into a commodious anteroom, the rumen, which is not a true digestive organ. A second receptacle, containing fluid, acts with the first, but only after the rumen is well stored with food and water does the cud-chewing performance begin.

It is the churning of the food by involuntary muscular action, together with action by the second stomach and lower part of the gullet, that causes the formation of the so-called "cud," which is regurgitated when the animal is at rest.



THE CUTS OF BEEF

1, The "chuck"; 2, the rib; 3, the loin; 4, the rump; 5, the "round"; 6, the flank; 7, the plate; 8, the shank. The plate extends forward under the shank and includes the brisket.

After being chewed and mixed with saliva, a cud or bolus—containing, in the case of cattle, about three or four ounces of food—is ready for digestion by the other stomachs.

THE CATTLE CENSUS

The world's cattle stocks are estimated in round numbers at 500,000,000 head; but this total includes Asian and African figures, upon which no great reliance can be placed; more especially the estimate dealing with Russian and British India possessions. Domesticated buffaloes enter to some extent in the East Indian estimates, and, on account of the disturbed conditions prevailing in Russia, there are no satisfactory figures available for that vast expanse of territory.

The United States, with its total of around 65,000,000 head, leads the world in point of aggregate valuation.

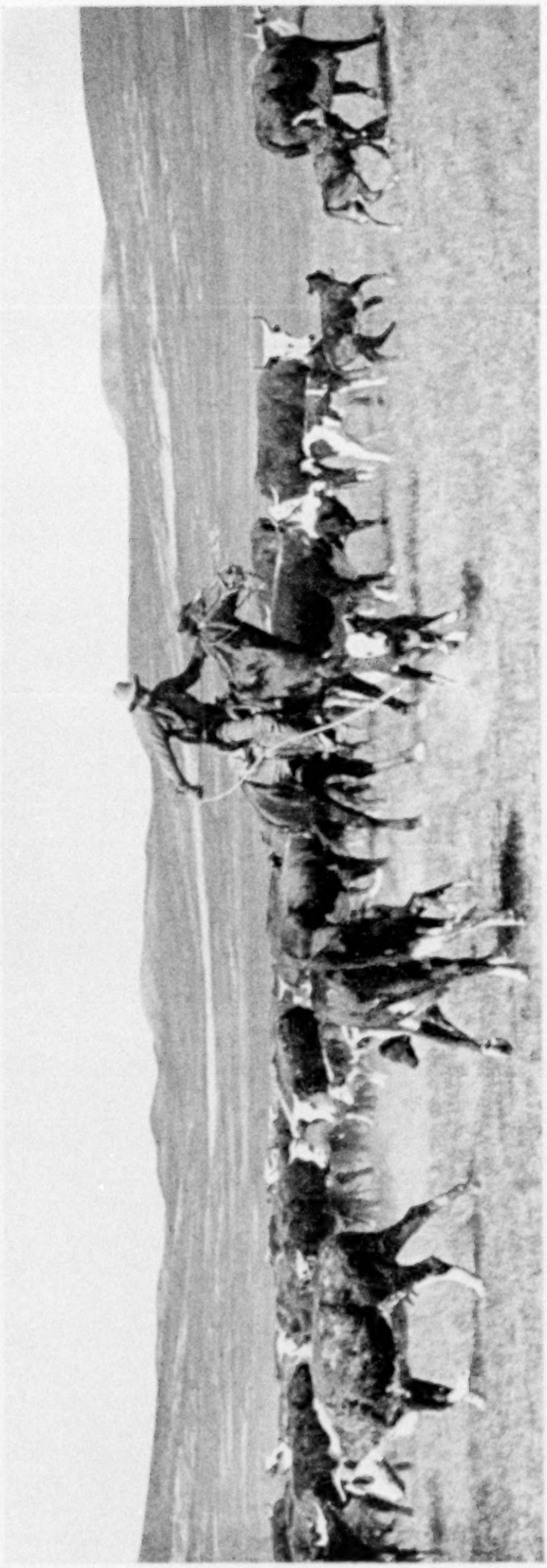
Great Britain stands supreme in the per capita valuation of her insular cattle possessions, because of the comparatively small number of substandard cattle upon her farms.

Argentina is rich in herds, and since the erection of great *frigorificos* at Buenos Aires, and the entrance of American packers into that vast area of supply, exports largely to Old World markets.

Australia has also developed an important cattle-growing industry, and by resorting to improved English breeds has come into the possession of herds that contribute, since refrigeration became a part of the equipment of British ocean-going freighters, to the Smithfield (London) market.

While Great Britain originated most of the world's best breeds of cattle of the beef-making types, her industrial development has so far outstripped her agricultural production, and her people consume so much more beef per capita than those of any other European country, that more of that product from foreign sources annually enters her seaports than those of any other nation.

The Englishman, like "Brother Jonathan," loves his good roast beef; but, unlike the latter, fails to grow enough to satisfy his own demands. In former years the United States shipped great numbers of live bullocks from the Corn



Photograph by Charles J. Belden

HEELING A CALF

This is the Western parlance for catching a calf by the hind legs. The more expert ropers always use this method instead of the easier one of roping the calf by the neck, as it is not so liable to injure the animal. The loop of the lariat can here be seen circling around the legs of the little fellow in the foreground.

Belt for slaughter at Deptford and Liverpool, but that trade is now practically a thing of the past.

Modern methods of refrigeration have enabled South American, Australian, and New Zealand ranchmen to cut heavily into the American export business in dressed meats for the British markets, the cost of production in the Southern Hemisphere being so much below that of our own country that Chicago packers have been compelled to invest heavily in Argentina in order to hold a share of the regular transatlantic business.

PROVISIONING THE WORLD IN WAR AND PEACE

Continental Europe is not a large consumer of beef, but lamb, poultry, hams, bacon, and dairy products enter extensively into the dietary of the people. In America and Great Britain beef is a staple article on all bills of fare, and fortunately for our own country we have not only the great grazing grounds of the arid West, but the unmatched corn crop of the central valleys to admit of beef-making in America upon a scale not approached elsewhere in the world.

Argentina can grow the Indian corn, the greatest animal-fattening food known, and does so in moderate quantities, but will probably never equal the United States in its production.

Napoleon asserted that armies travel on their stomachs. The troops of the Entente Allies in the World War were the

© Merl La Voy

CUTTING OUT CATTLE IN QUEENSLAND: AUSTRALIA

The great plains of this island continent provide excellent pasturage for cattle and sheep. Although wool-growing is the more important industry, the exports of beef and hides amount to many millions of dollars annually. The white faces and red bodies of the animals shown in this picture reveal the blood of the English Hereford (see Color Plate XI).

Photograph by William R. Barbour

CROSSBRED PAMPAS CATTLE OF ARGENTINA

The owners of great *estancias* (ranches) have brought the original Spanish stock up to a modern beef standard mainly by the extensive use of Shorthorn and Hereford bulls imported from England and now bred in large numbers in Argentina. The Shorthorn is in particular favor. Brahman bulls have also been used to a comparatively limited extent for crossing purposes. "Once upon a time cattle were raised and slaughtered in Argentina solely for their hides and horns" (see text, page 591).

best-fed soldiers of whom history has record. Refrigerated, cured, and tinned meats from the United States supplied the solids of the "mess" that sustained the forces of Britain, France, and the United States during that eventful contest of physical endurance. The organization and the enormous resources and facilities of American packing plants alone made it possible properly to supply the Allied troops on foreign soil.

The vast quantities of beef forwarded regularly by the United States during the extended period of hostilities demanded strenuous efforts upon the part of American cattle feeders to meet this sudden, imperative demand; and the equally sudden disappearance of war-buying by the Allied governments was responsible for the financial distress that overtook Corn Belt meat makers, rangemen with large commitments, and the packers themselves, when the signing of the armistice precipitated wholesale liquidation in a war-inflated industry.

All had been operating upon a basis of high-production costs; lands had mounted to valuations resting upon the insecure foundation of steers, hogs, and sheep at around $20 per hundredweight, wheat at $2, and corn at $1.50 per bushel! Farm labor, owing to the draft, was cut short and help was almost unobtainable.

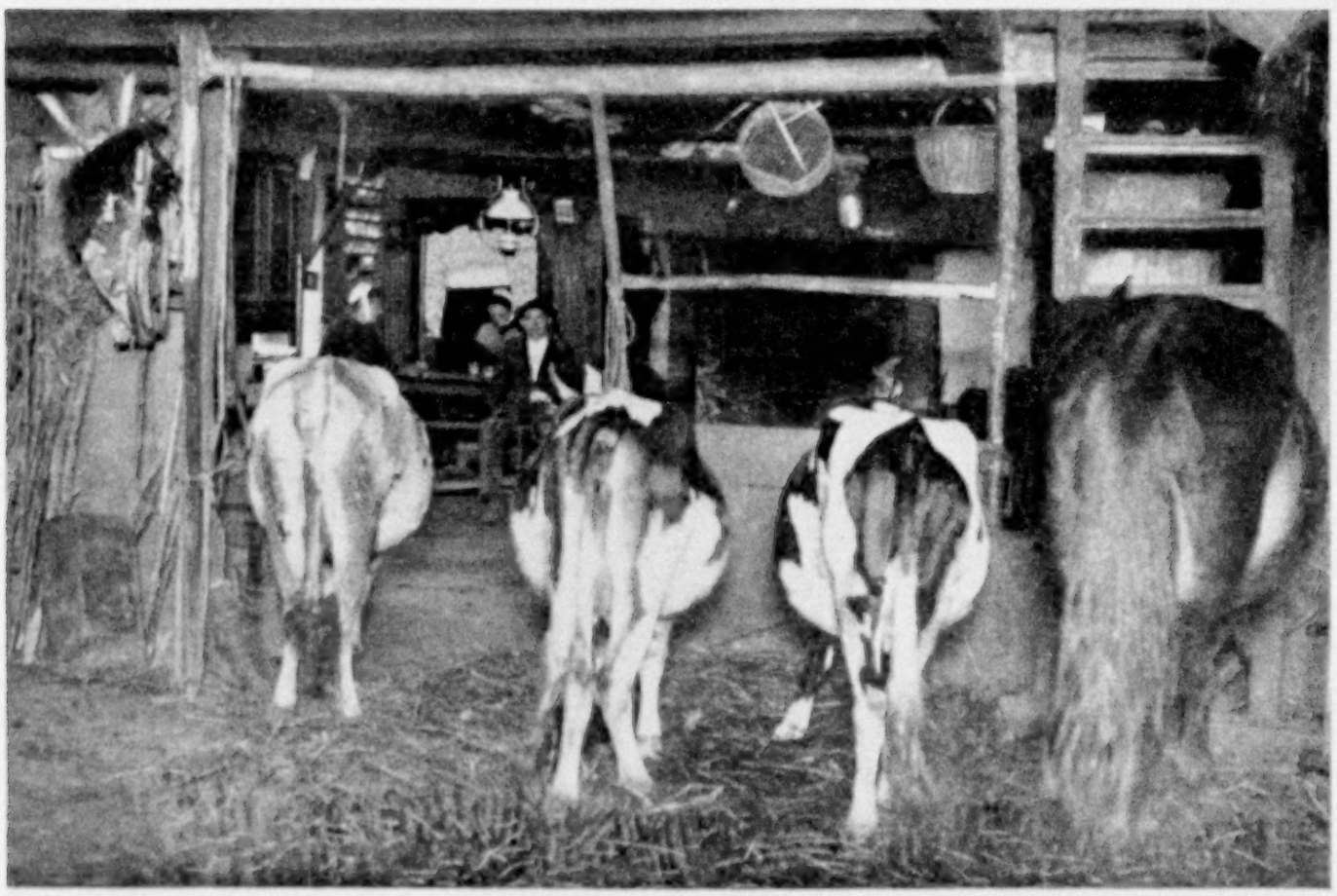
Sheer was the descent from apparent prosperity to adversity. The American cattle growers have indeed paid their share of the prodigious material cost of the conflict overseas, in hundreds of pathetic instances, by loss of lands, homes, and the savings of a lifetime.

The Far West cattle business will be years recovering from the passing of the tidal wave that first rushed prices up to abnormal heights, only to be followed by a recession to abysmal depths. Slowly the readjustment is being brought about, but this is a chapter in the economic history of a basic industry that cannot be fully treated here.

While beef among all Anglo-Saxon peoples is synonymous with brawn, and therefore contributes heavily to the fighting strength of their arms, it is of equal potency in the case of Anglo-Saxon labor

Photograph from Lieut. Col. Alfred Heinicke

MASTER AND MILCH COW: SOUTH GERMAN TYPES



Photograph by Crété

COWS IN THE KITCHEN

In parts of rural France and other continental countries it is not uncommon to see the farmhouse and stable built together. One of the cows in this picture appears actually to be standing in the kitchen.

© Charles J. Belden

"THE DRAGS," OR REAR END OF A TRAIL HERD (SEE, ALSO, PAGE 680)

From the original Andalusian stock brought to the New World by the Spanish *conquistadores* sprang the vast numbers of Longhorns which roamed the plains of the Southwest a hundred years ago. As the business of cattle ranching developed during the past century, these native cattle were crossed with other breeds, improving the range stock to a marked degree.

in mills, mines, forests, factories, and fields. When to that we add the wealth of vitamins and vigor contributed by the dairy cow to infancy, youth, manhood, and old age by the milk, cream, butter, cheese, and other products, now available in a multitude of palatable forms, we may begin to comprehend the part played by cattle in the upbuilding and sustenance of nations.

GOOD BEEF FOR EVERYBODY

Unfortunately, the American public is altogether too indifferent as to the *quality* of the beef to be obtained from the average vender of meats. Aside from a comparatively limited demand for strictly prime corn-fed beef from certain clubs, hotels, and high-class restaurants in the larger cities, there is a very narrow outlet for the rich, finely-marbled beef which could be produced by American farmers in great volume if consumers would only insist upon having it. Consumers must learn the lesson that very lean meat is always tough meat, and that the muscular tissues of animals are only made tender and full-flavored by the presence of plenty of fat.

The Department of Agriculture has recently prepared colored plates for general distribution, illustrating the difference between good beef and the inferior cuts, and a general awakening upon the part of the American public in respect to this important subject would mean much to our farmers at this time. We have the breeds and we have the feeds, yet our people consume vastly more poor beef than good.

That is not true in the case of butter. The public would not stand for low-grade dairy products. Why are not housewives as particular as to quality in meat as they are in regard to butter? They have the remedy in their own hands, if they will only apply it. Insist upon better roasts, steaks, and chops, and they can be obtained. The finest in the world are produced here in our own country, and yet our feeders and breeders suffer losses constantly because the public puts up with almost anything offered in the way of fresh meats.

Reform in this direction lies at the bottom of a more successful animal husbandry in the United States.

THE SONG OF THE BELL

Throughout immemorial ages there has existed between men and the Taurine tribes a most intimate relationship. The ministrations of the herds to humankind have been continuous and beneficent through all generations. Anything, therefore, that brings assurance of the nearness and safety of the cattle to the descendants of a nomadic ancestry arouses a certain elemental sense of peace, security, and comfort.

In that fact is found the psychology of a certain satisfying reaction registered by almost every human mind at the sound of cowbells tinkling somewhere in the distance, from across green fields, as darkness settles down upon the earth.

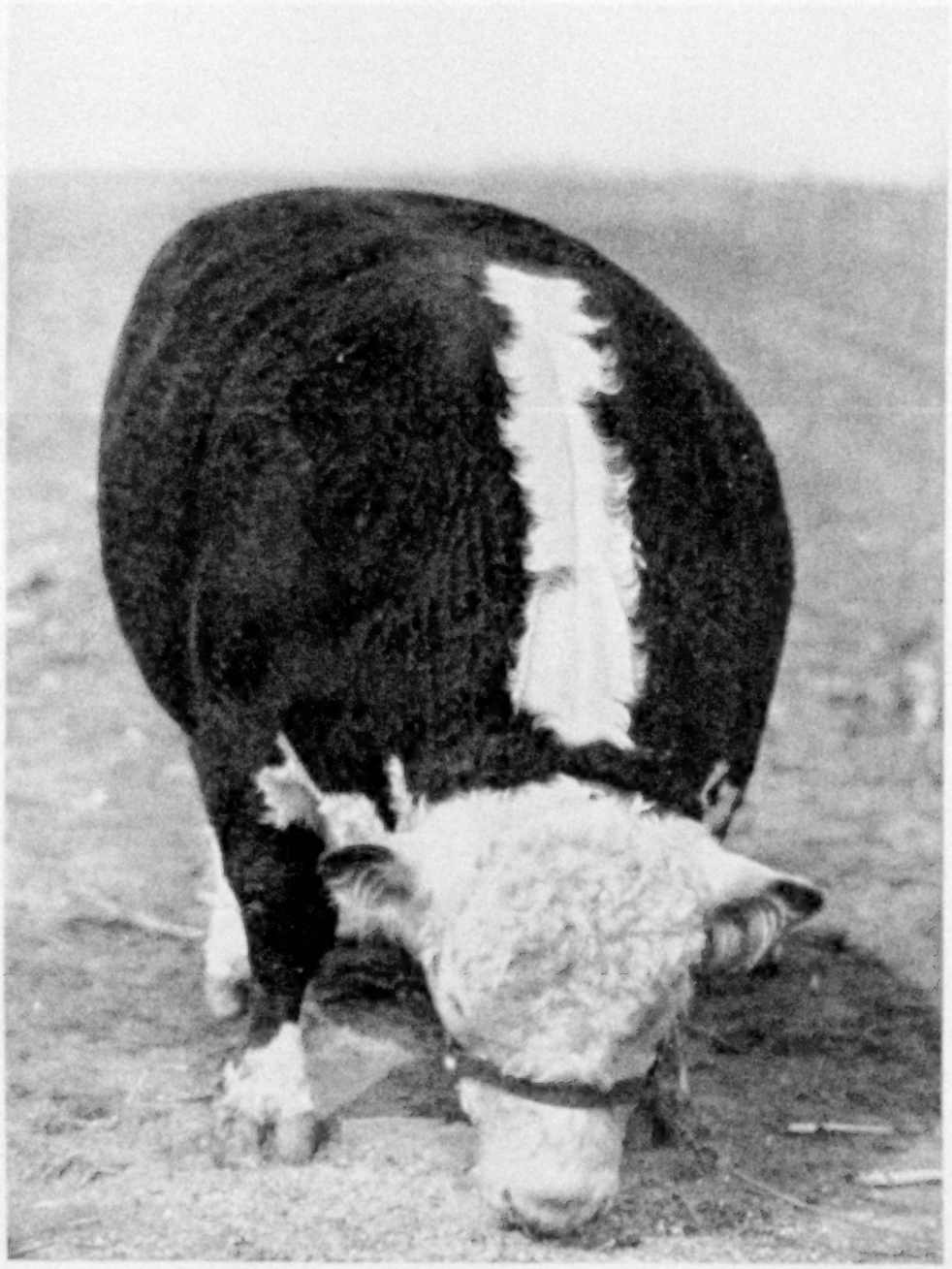
Those mellow notes, so dear to the memories of the rural-born, are not now heard so frequently as in the pioneer days of our country's history; but in the remoter farming districts, and, of course, in the Swiss Alps, one still may hear rustic harmonies as the kine take the homeward trail, their founts brimming from long midsummer days afield.

WHERE "BOSSY" GETS HER NAME

Naturalists list cattle, buffaloes, and bisons as near relations in the *Bos* branch of the animal creation. Hence the term of endearment frequently applied to the family cow. She is "bossy" by right of strictly scientific assignment. What we commonly call a Buffalo is not a Buffalo at all. His right name is Bison, and he has a cousin known as the Yak—he with the long skirt of dark-brown hair extending well down his short legs, seen in zoölogical gardens and menageries (see Color Plate III and text, page 640).

The real Buffalo (commonly Water Buffalo) is domesticated in the tropic East, and is a useful beast of burden in the Philippine Islands, India, and other hot regions of the Orient (see Color Plate V and text, page 641).

The Yak is a central Asian product, and in his domesticated state is thought by some to represent a cross of the wild Yak bull upon some type of domesticated cow of the Taurine tribe.



Photograph by Smith and Morton

A POLLED HEREFORD BULL

While it has been commonly accepted that the original wild cow was horned, there have long been well-defined races of hornless or polled cattle. Indeed, certain scientists contend that the polled type is the original *Bos taurus*. Hornless calves, known as "mooleys" or "muleys," occasionally appear in almost all of the improved horned breeds, and it is not uncommon for these mutations to reproduce their own peculiarity. This polled Hereford bull is a fine example of the hornless type of English "white-face" developed in the United States in recent years by systematic attention to the polled characteristic.

There is a recognized ancient relationship between the Gaur, the great wild ox of Asia, the Yak, such East Indian humped Bibovines as the Gayal and the Banteng, the various buffaloes, the Bison, and our cattle proper. If there be such a thing as a connecting link between the Bisontine and the Taurine (cattle) groups, some authorities maintain that it was probably the East Indian Gayal, or Jungle Ox, the native habitat of which was the mountain forests east of the Brahmaputra.

The Gayals were forest rangers, avoiding the plains and valleys. They browsed off shrubs and tender shoots of trees and grasses. In color they were various shades of brown, with white markings on legs, bellies, and tips of tails. In size they were not unlike the common ox, and were not only docile under domestication, but so fleet of foot that the natives sometimes used them under saddle. The females yielded rich milk, and the Hindus would not shed their blood, holding them in the same veneration as the sacred Brahman cow (see Color Plate IV and text, page 640).

THE URUS AND THE CELTIC SHORTHORN

Aside from the Brahman breed, of remotest Indian origin, it is believed that all present-day types of cattle known in Europe and the Americas are descendants of two aboriginal races, one large and commonly known as the Urus, and the other the so-called Celtic Shorthorn. The former ranged throughout western Asia, northern Africa, and practically all of Europe. It is said to have had a hairy coat, varying in color from black and dark brown during the summer months to gray in the winter. It had a white or grayish stripe along the back, and the ancient Teutons knew it as the Aurochs.

Cæsar in "De Bello Gallico" called the animal the Urus, such as he had known

Photograph by Charles J. Belden

THE END OF THE TRAIL

In the great stockyards of Chicago, Kansas City, Omaha, and other centers the stockman finds a cash market for his cattle.

in the Hercynian forest, and described it as "approaching the elephant in size, but presenting the figure of a bull." Fossil remains indicate a height of six feet at the shoulder.

The widely distributed wild Celtic Shorthorn was decidedly smaller than the Urus and had a shorter face, but a longer and broader forehead. In color the Shorthorns were solid, shading from blackish brown to gray.

THE WILD WHITE CATTLE OF TO-DAY

Speaking broadly, our larger breeds of cattle are supposedly of Urus origin and the smaller of Celtic Shorthorn derivation.

The nearest kin to the Urus at the present time, according to most authorities, are the so-called Wild White cattle of Great Britain (see Color Plate VI), preserved, as a matter of scientific interest, upon various landed estates, as illustrated by the herds at Chillingham Park, Northumberland, the property of the Earl of Tankerville, and at Cadzow Forest, Lanarkshire, Scotland, seat of the Dukes of Hamilton. The lapse of centuries, however, has so changed these specimens that they approach their alleged forbears neither in color nor in size.

The Uri of the Continent were "commonly black or mouse brown," and this is held to explain the fact that the Wild

Photograph by H. A. Strohmeyer, Jr.

THE LOWING HERD WINDS SLOWLY DOWN THE LANE

These cows are "golden Guernseys," the adjective being applied because of the rich yellow color both of the milk and butter they produce and of their own skin. Channel Island farmers have always laid great stress upon the relationship between the color of the skin and the color of the butter (see text, page 676).

White cattle of the British parks not infrequently show black markings.

The Cadzow Forest breed has jet-black tips of horn, black tongues and muzzles, black hoofs and black hair at the kneecap, and sometimes black stockings. The Chillingham cattle, on the contrary, commonly have red ears, and black spots in the skin are sometimes observable.

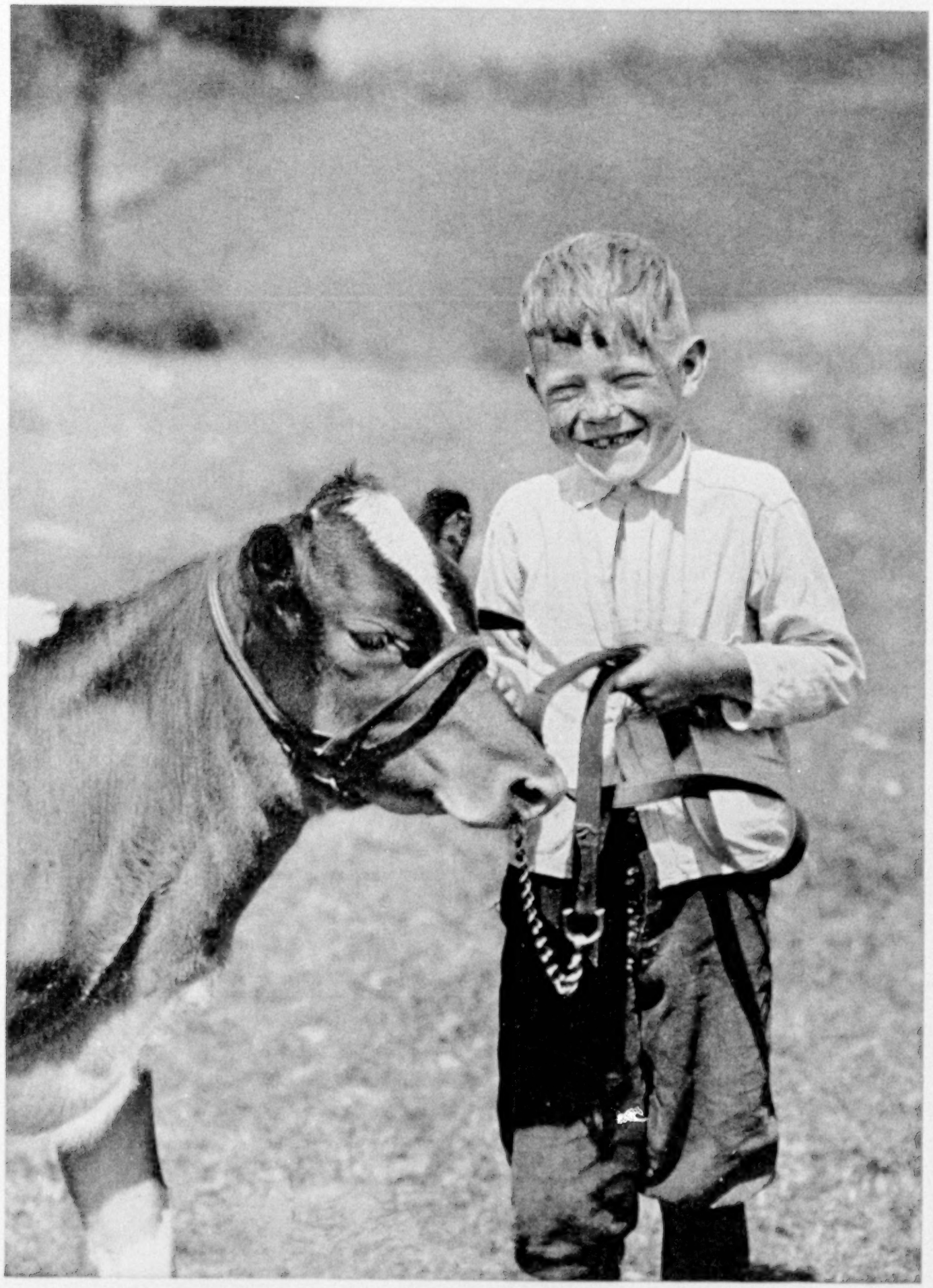
It has been suggested that the Uri of the present mainland, reaching northern Britain during times when the North Sea was probably a plain and in an age when only the lowlands had emerged from the ice sheet, in the course of centuries took on the white color usual to Arctic animals and birds to meet the conditions of a frigid environment. This, however, is mere surmise.

In their ancient habitats, the operation of the natural laws of environment and the survival of the fittest shaped wild cattle types to meet their several requirements. Nature makes no mistakes in that respect.

FIRST STEPS IN DOMESTICATION

In the regions where man probably first brought cattle under subjection, the types available, in obedience to the laws just mentioned, were neither heavy-bodied flesh-bearers nor deep milkers. The quest for food and water called for activity and muscular development. In fact, shortness of leg, compactness of body, and a tendency to put on fat, distributed throughout the entire carcass—the distinguishing characteristics of our modern beef breeds—would have been distinct handicaps in primeval grazing grounds and forests.

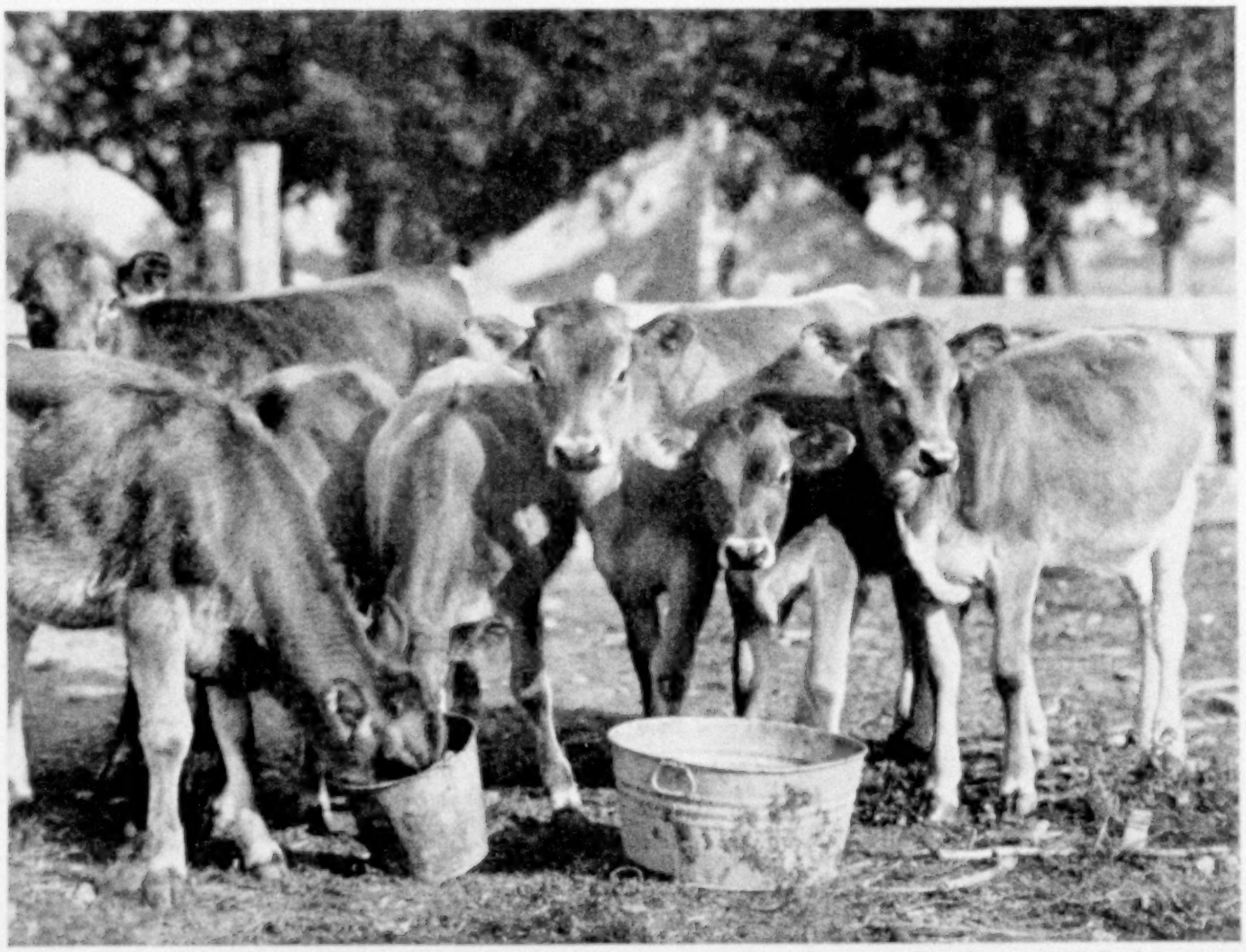
Still, Nature apparently deemed it wise to provide some sort of storehouse in certain cases against a day of possible want.



© H. A. Strohmeyer, Jr.

"WHEN A FELLER HAS A FRIEND"

This happy young American is posing with a purebred Guernsey on a New York dairy farm. Many years ago one of the Empire State's county banks printed its notes in golden yellow as a token that from butter came the prosperity and riches of the community.



Photograph by Belle Johnson

BUCKET-FED BABIES

Dairymen commonly wean their calves at an early age, and as a result many of them are mothered in this way.

Hence, it is argued, the hump of the Indian cattle and the camel, and the fat caudal appendage of certain species of sheep.

As to milk flow, it is obvious that in a wild state none was needed beyond the requirements of the young. When man first undertook the domestication of wild cattle, the animals possessed only those characteristics demanded by their own existence, without producing a surplus for any other purpose.

Man was, for a time at least, content to accept the wild types as he found them; and in the early nomadic ages he followed the herd about in its instinctive search for food, just as certain North American Indians followed the Bison's migrations at a much later date in human history. The cattle did the work; man lived off their labors.

There came a time, however, when the nomads began to have local habitations. This called for arrangements whereby the cattle could be maintained near by, without being compelled, or permitted, to wander far afield. Grasses for their use were conserved; forage necessarily provided. Man began to supply the herd with that which previously the cattle had to seek, as best they could, for themselves.

Better keep and a more limited range made for improvement, since all animals respond to generous feeding. This, therefore, was the beginning of greater capacity for supplying human wants. Then, by and by, it dawned upon the ancient herdsmen that it would be a good plan to try to control propagation in the interest of better conformation and increased production, and therein lies the genesis of modern stock breeding.

THE HERD WAS EXALTED BY ANCIENT CIVILIZATIONS

Greek and Roman mythology abounded in bovine recognition. The Farnese Bull and other marbles, and the skull still used

© H. Armstrong Roberts

JUST A BITE BETWEEN MEALS: GUERNSEYS

Wisconsin, Pennsylvania, New York, and Minnesota are strongholds of the Guernsey. Nearly a quarter of all the purebred representatives of the breed are to be found within the borders of the Badger State.

Photograph by J. Russell Morse

AGRICULTURE IN TIBET

The pair of Zos led by the woman are half-breed animals. They are a cross between the male Yak and female Zebu, and are much more docile animals than the purebred Yak, which is often surly and undependable and does not take kindly to the plow. After the land has been plowed and cross-plowed, it is leveled in the fashion shown here. While the woman leads the Zos, a man stands atop a plank which is dragged over the broken ground.

in architectural and interior mural decoration, indicate that in art, as well as in religious and other ceremonial rites, kings, priests, and men of great affairs—the rich, the poor, the mighty, and the humble in every walk of life—regarded cattle as a part of the national heritage to be exalted and preserved almost as a sacred trust.

The greatest sacrifice that could be made to propitiate the powers supposed to dominate the destinies of men was the offering of the most valued member of the herd. The Grecian urn, immortalized by Keats, depicted a familiar scene:

"To what green altar, O mysterious priest,
Lead'st thou that heifer lowing at the skies,
And all her silken flanks with garlands drest?"

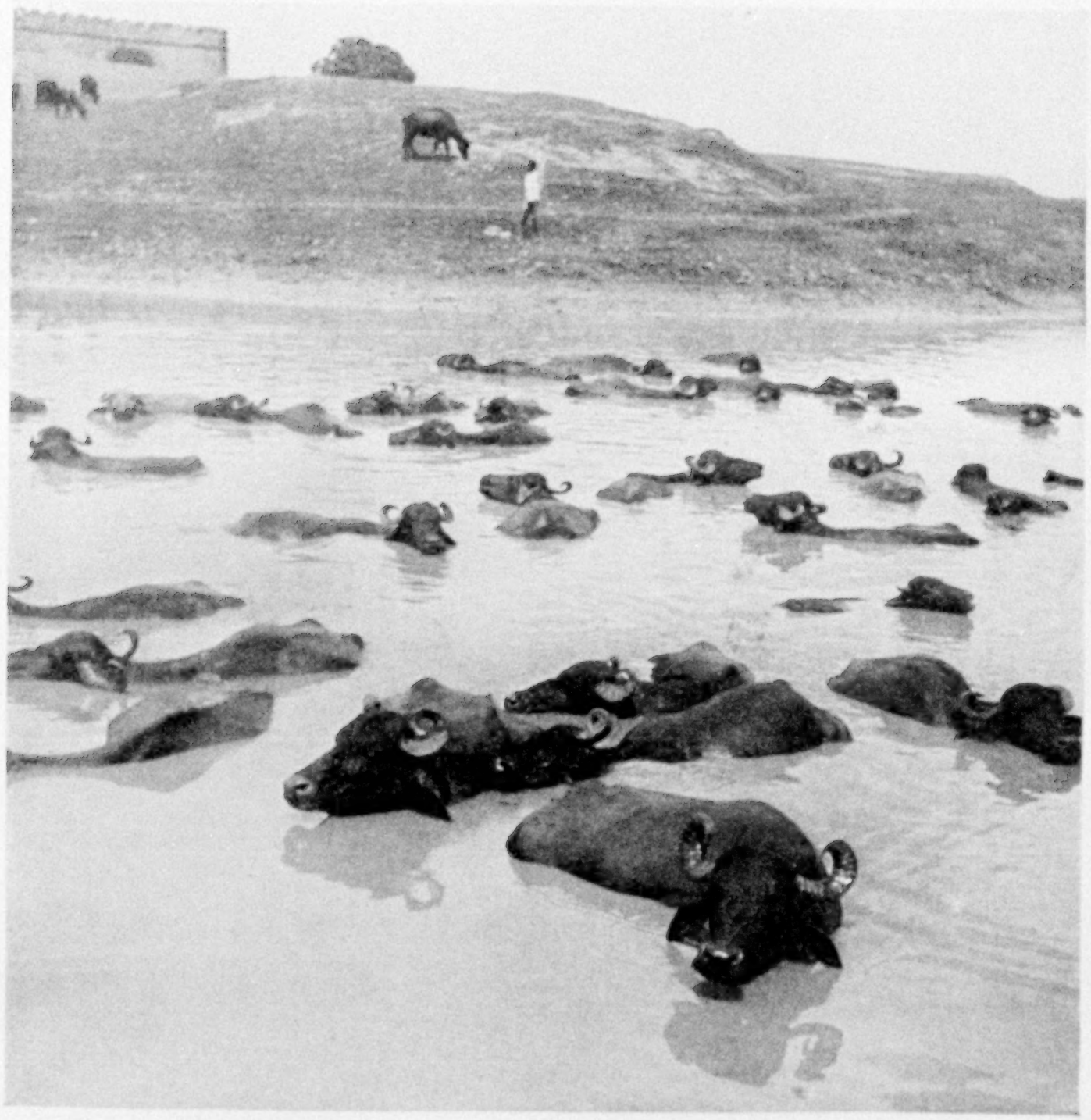
In Egypt the cow was sacred to Isis. Gaily decorated cattle were favorite forms of gifts among the Latins, and Vergil represents Queen Dido as presenting to the companions of Æneas "twenty fine bulls, an hundred bristly boars, an hundred ewes, with each a well-fed lamb."

According to Aristotle, the dorsal-humped Zebus, the sacred cattle of ancient Hindustan, were found in Syria before the Christian Era, and Grecian sculptors gave a dewlap to their oxen that resembled that of the Zebu; but, aside from this, the Greeks depicted no other characteristics of the Indian breed. The Egyptians, as well as the Greeks, in their figures of the zodiac always outlined the conformation of the ordinary ox.

THE OX AT THE YOKE

The Hindus, Greeks, Egyptians, Romans, and Hebrews, all revealed affection for the herds inherited. Cattle were not then, as in these modern days, valued merely for what they could be made to yield in the satisfaction of human wants. They were made partners in the fêtes and gala celebrations. Crowned with wreaths, they were paraded as an integral part of triumphal pageants. They were, however, partners in work as well as play.

The ox was extensively used at the



Photograph from Keystone View Company

INDIAN WATER BUFFALOES IN THE JUMNA RIVER, NEAR DELHI, INDIA

These beasts will stand in the water for hours at a time with only their heads and backs showing.

yoke by the ancients, as he is to this day in various parts of the world, including our own northern New England States and in the southern Appalachian regions. The Greek poet Hesiod, in his "Works and Days," the oldest-known work upon agriculture, gave this advice as to the oxen on the farm:

"For draught and yoking together, nine-year-old oxen are best, because, being past the mischievous and frolicsome age, they are not likely to break the pole and leave the plowing in the middle."

Early maturity was clearly not a characteristic of the Grecian herds. The same author preaches good care and "preparedness," as follows:

"The cattle should be kept in good condition, and ready for work, when the migratory crane's cry bespeaks winter's advent and the prospect of wet weather. Everything should be in readiness for this; and it will not do to rely on borrowing a yoke of oxen from a neighbor at the busy time."

The Hindus and Hebrews, by practice and precept, protected the ox from abuse by his owner. A Scriptural edict ran,

Photograph from Jonkheer J. Loudon

WATER BUFFALOES IN THE DUTCH EAST INDIES

The plow being used to cultivate this muddy rice field consists simply of a forked stick tipped with iron as a blade, attached to a straight pole which serves as a handle. Although primitive, such a plow is best adapted to the peculiarities of rice culture. The miniature shocks in the foreground are young rice plants, which have been taken up by the roots from the nursery field and are now ready to be transplanted.

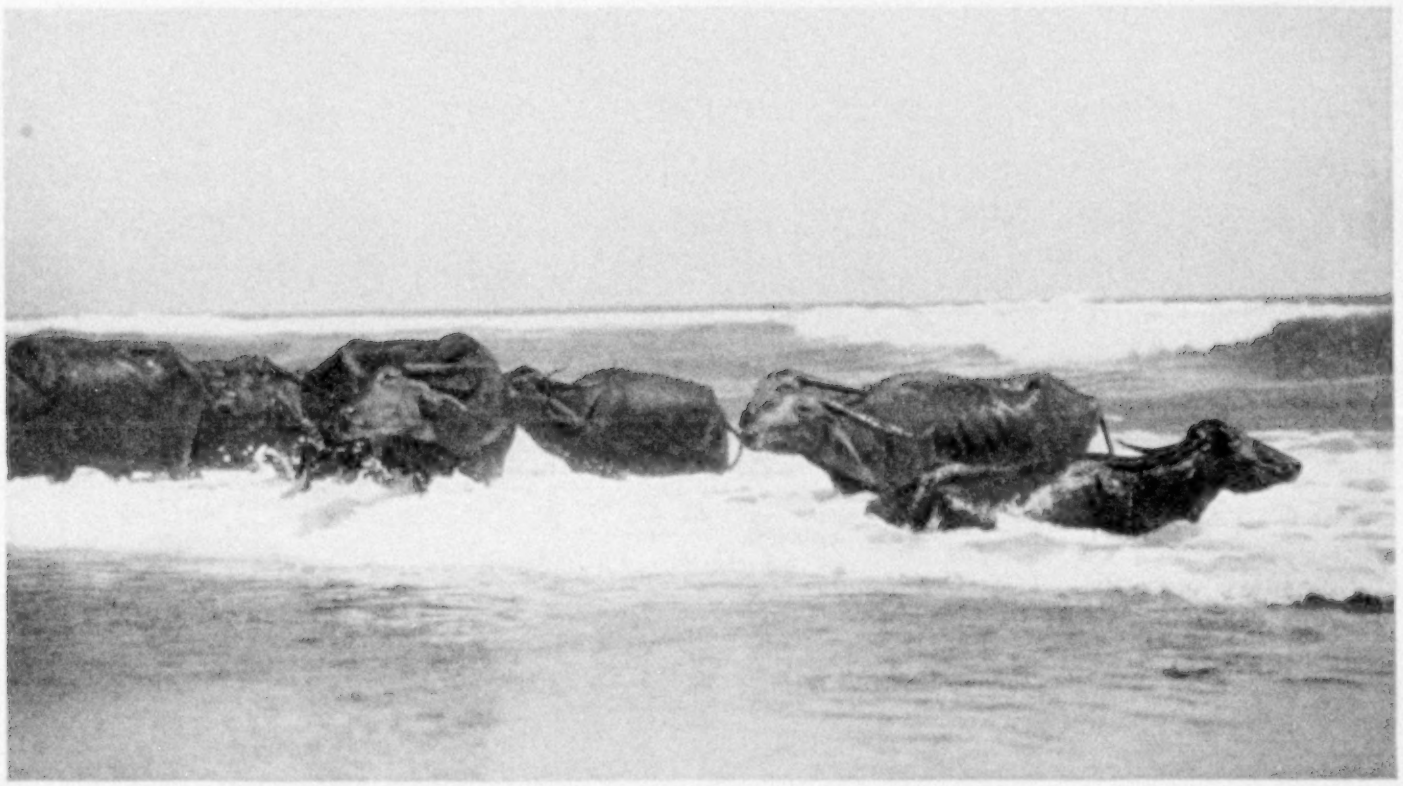
"Thou shalt not muzzle the ox when he treadeth out the corn."

Roman writers were especially insistent on humane treatment of the ox: "The length of a furrow should not exceed 120 paces, or else that the oxen shall have a time for breath." The plowman is required to "shift the yoke, that their backs be not galled," and exhorted to "moisten their mouths with water, and to strengthen them with wine when suffering from fatigue." To destroy them wantonly was a punishable crime against the State.

In Biblical days worldly riches were measured largely in terms of herds and flocks. The Roman word for "money" was *pecunia*, from *pecus*, cattle, and in all antiquity it is apparent that cattle were prized possessions.

The Scriptures abound in references to the reliance placed by the patriarchs upon their herds. When Jacob and his brethren were called by Joseph into Egypt, they were presented to Pharaoh as men whose "trade hath been about cattle from our youth even until now, both we, and also our fathers."

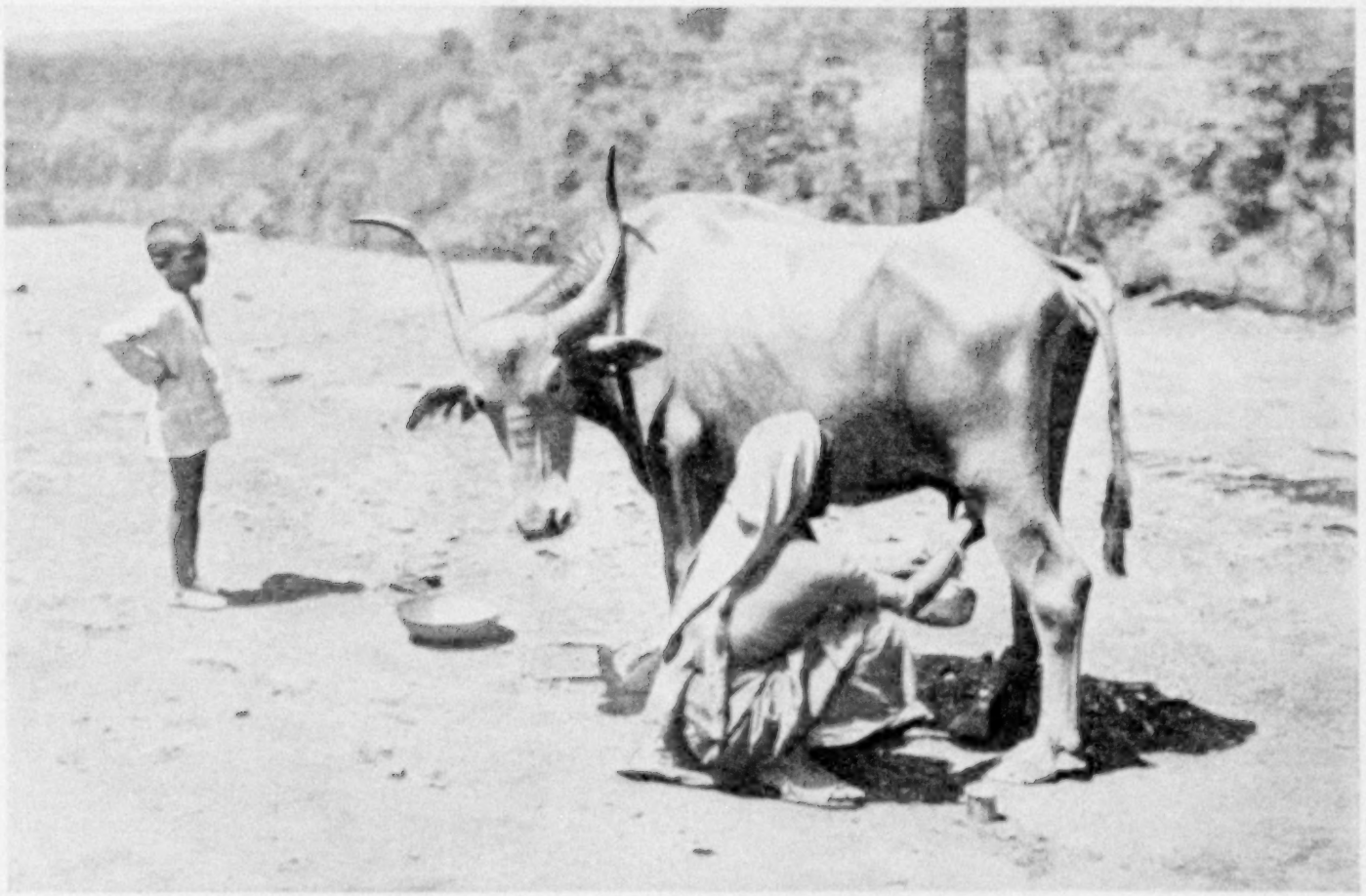
The ancient law threw every protection



© Wiele and Klein

WATER BUFFALOES IN THE SURF NEAR THE CITY OF MADRAS, INDIA

"The real Buffalo is domesticated in the tropic East, and is a useful beast of burden in the Philippine Islands, India, and other hot regions of the Orient" (see text, page 603).



Photograph by Clifton and Company

MILKING A BUFFALO

Many of the native tribes of India maintain great herds of Buffaloes for the sake of their milk and butter. Buffalo milk is very rich and makes excellent cheese but it is thick and has a peculiar flavor that does not appeal to the average American palate.

Photograph by Platé, Ltd.

THE COVERED WAGON IN CEYLON

around ownership: "If a man shall steal an ox, or a sheep, he shall restore five oxen for an ox and four sheep for a sheep."

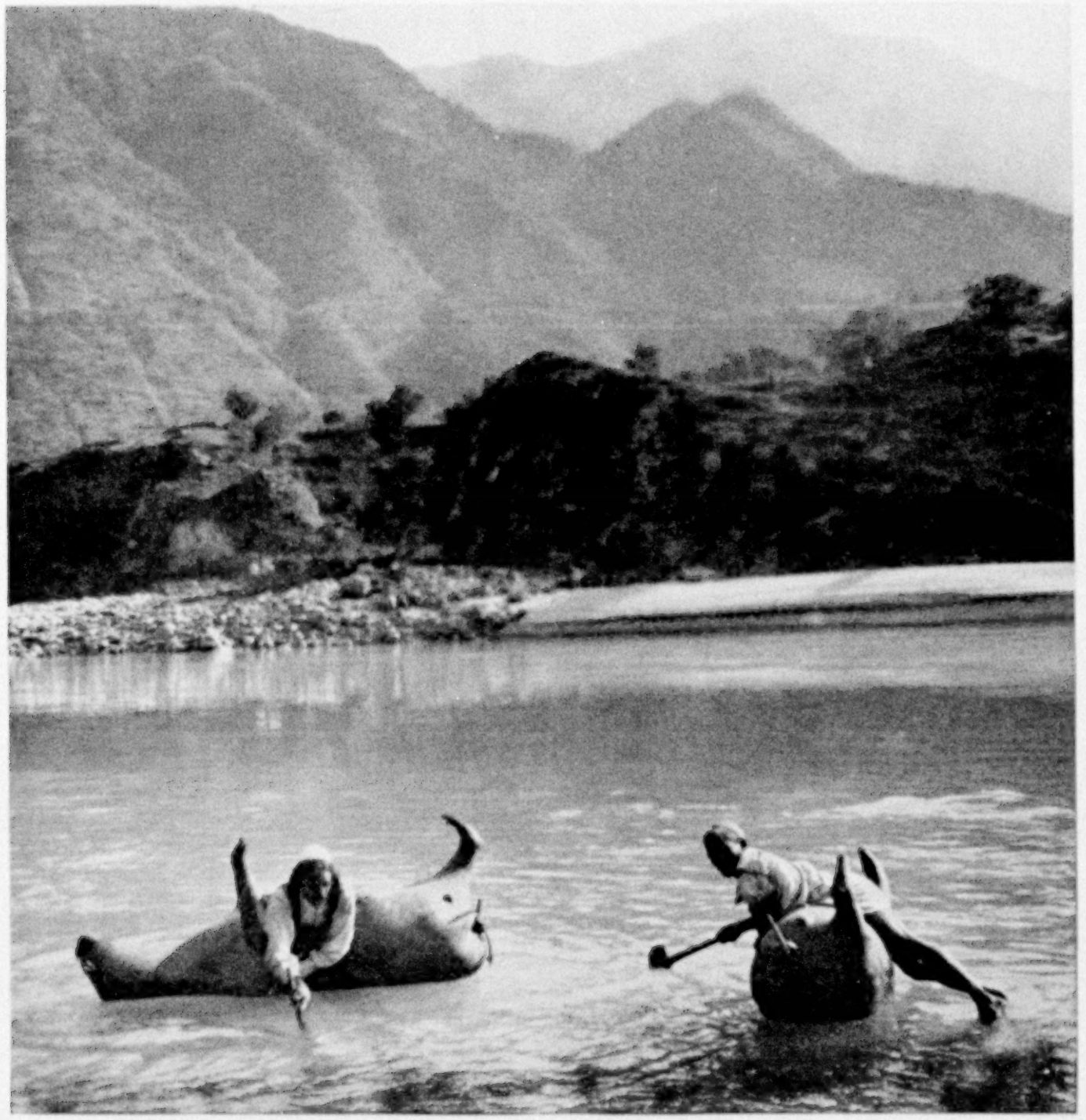
TORCH-BEARING BULLOCKS EMPLOYED BY HANNIBAL

According to Livy, the ox played an important part upon one occasion during the Punic Wars. The Roman historian thus credits Hannibal with having effected the escape of his army from a well-laid trap set by Fabius Maximus for the destruction of the invading host: "Two thousand oxen, with lighted pine torches tied to their horns, were driven into the hills at night, thus presenting the appearance of a moving army." Under cover of this diversion the Carthagenians slipped through the net!

In one of his most delightful sketches dealing with English characteristics, Emerson points out the intensely practical bent of the British mind and, among other illustrations of the way in which they manipulate things to serve their own purposes to the best advantage, says:

"The native cattle are extinct, but the island is full of artificial breeds. The agriculturist Bakewell created sheep and cows and horses to order, and breeds in which everything was omitted but what is economical. The cow is sacrificed to her bag; the ox to his sirloin."

One has only to see a record-breaking dairy queen, or a modern Christmas bul-



Photograph by Frank Scott

INFLATED CATTLE SKINS SERVE AS RIVER CRAFT TO THE HINDUS

lock, to appreciate the humor of the idea of a cow that has found herself turned into a mere annex to an udder of gigantic proportions, or of a fat steer that wanders about on short pegs supporting a mountain of meat!

The modification of the forms and functions of the leading types of domesticated animals through human intervention to meet various needs and differing environments was not made the subject of intensive study for many centuries. The story of Jacob's little trick upon Laban in the placing of the famous rods before the breeding cattle suggests, however, that some attention was given by the patriarchs of old to attempts at prenatal control of the character of progeny.

The Romans were students of breeding types and the problems relating thereto, as reflected by Columella and various Latin writers. That attention was paid in Vergil's time to blood lines in the mating, and that the branding iron of our Western ranges is no new invention, are revealed by these Georgic couplets:

"Strait stamp their lineage with the branding fire;
Mark which you'll rear to raise another breed,
Which consecrate to altars, which to earth
To turn its rugged soil and break the clods."

© Underwood and Underwood

A BULLOCK CARAVAN IN MANCHURIA

The Peking Pike is a wonderful stone-ballasted, well-graded road extending across Manchuria and Chosen (Korea). It is probably older than the famous roads built by the ancient Romans and has ever been a highway of tremendous strategic importance in the East. Manchurian farmers are driving their cattle to market laden with sugar cane, bamboo, and rice shoots.

Improvement looking toward more generous milk production antedated efforts at adding to flesh-making proclivities. A Biblical expression for a particularly favored land was one "flowing with milk and honey." Due to climatic conditions, the south Asian and Mediterranean seacoast peoples have never been, and are not now, large consumers of beef. Milk and yoke-service were the objects specially sought in their cattle-breeding operations.

Modern Taurine history, up to comparatively recent years, centers along the shores of the English Channel. All of the world's most widely disseminated improved cattle types at the present time have been originated either in Great Britain, upon the continental mainland immediately opposite, or in the islands off the coasts of Normandy and Brittany.

With the single exception of the valuable contribution made by the Swiss, we

Photograph by Winfield Dudgeon

A HILLSIDE IN INDIA WHERE GRAZING COWS HAVE CREATED A VAST NETWORK OF PATHS

In some of the mountainous parts of India the slopes are so steep that the cattle have to graze most intensively to obtain sufficient sustenance. Where such search for food has been carried on for a long time, diamond-shaped systems of paths have been created by the cattle.

must credit to the British, Dutch, and French the great herds that now make up the pastoral wealth of Europe, the two Americas, and Australasia. To the British we owe practically all the breeds that best enable feeders to produce prime beef. To their neighbors of the Netherlands and the Channel Islands must be assigned a credit in the dairy world, the magnitude of which is reflected in the three words—Friesian, Jersey, Guernsey!

The Bretons and their cousins of old Normandy have not attained wide distribution of their useful cattle outside their own boundaries. Our North American cattle are practically all of British, Dutch, Swiss, and Channel Islands origin.

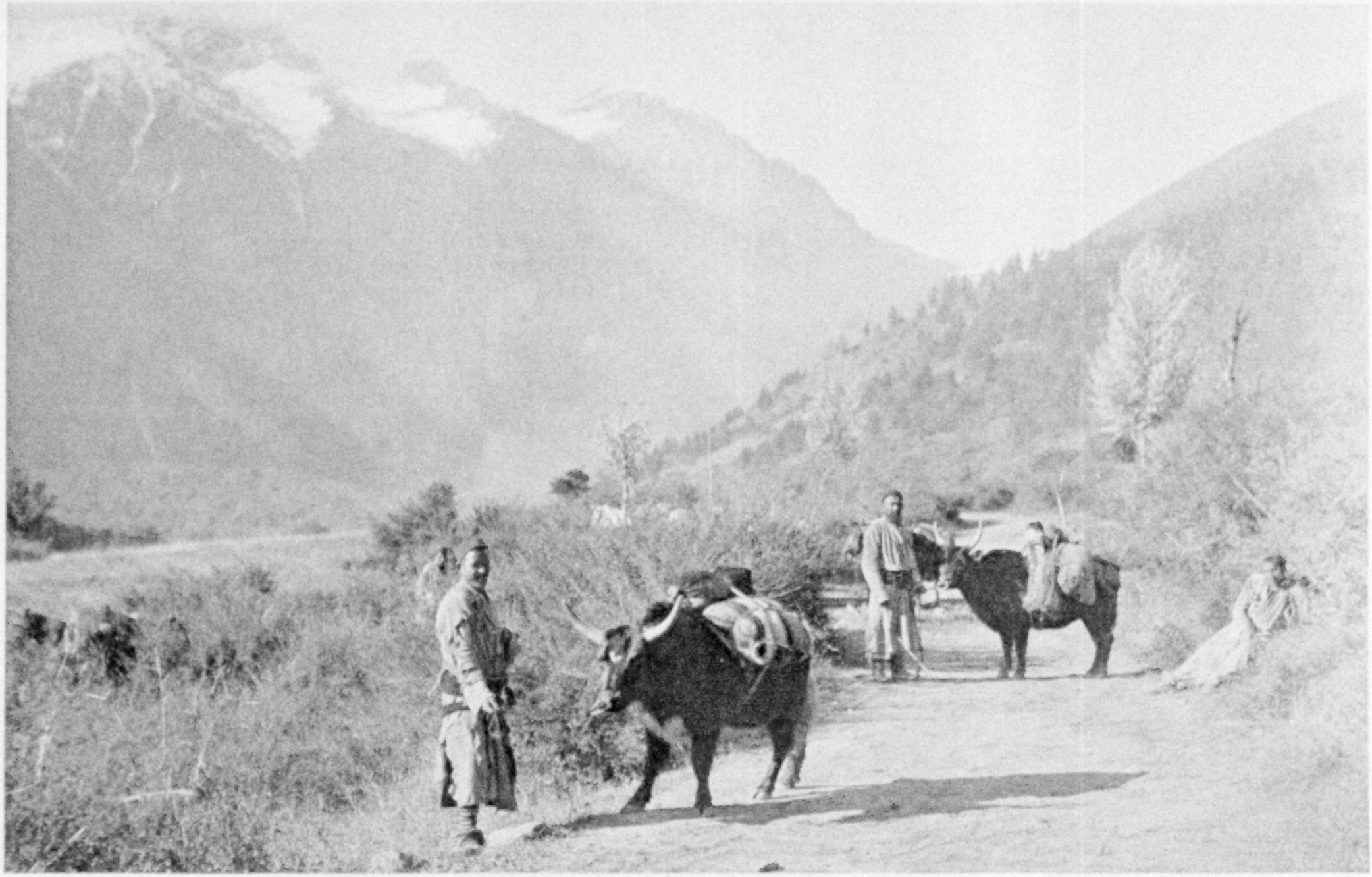
While milk was for ages the primary object sought by most keepers of cattle, the present perfection of dairy form and capacity is, as in the case of the beef and dual-purpose types, a comparatively modern development.

In no department of the animal breeder's art has achievement reached higher levels than has been recorded in the case of the Jersey (see Color Plate XII), the Guernsey (see Color Plate XIII), the Holstein-Friesian (see Color Plate X), the Ayrshire (see Color Plate XVIII), and the Brown Swiss Cattle (see Color Plate VIII). Of these the black-and-white Dutch and the Channel Island groups are numerically the most important in the United States.

ENGLAND'S LOVE OF ROAST BEEF BROUGHT ABOUT NEW TYPES

The Ayrshire, Great Britain's solitary contribution to the special dairy division, has, however, gained powerful support in recent years (see text, page 699).

The English were not satisfied with milk alone. John Bull is too carnivorous by nature to be content with anything but the choicest of meats, and so he early set about the creation of the Shorthorn, the Hereford, the Aberdeen-Angus, and other breeds that cut rich beef in every part of the carcass (Color Plates VII, XI, XIX).



Photograph by Fred Bremner

TIBETAN TRANSPORT

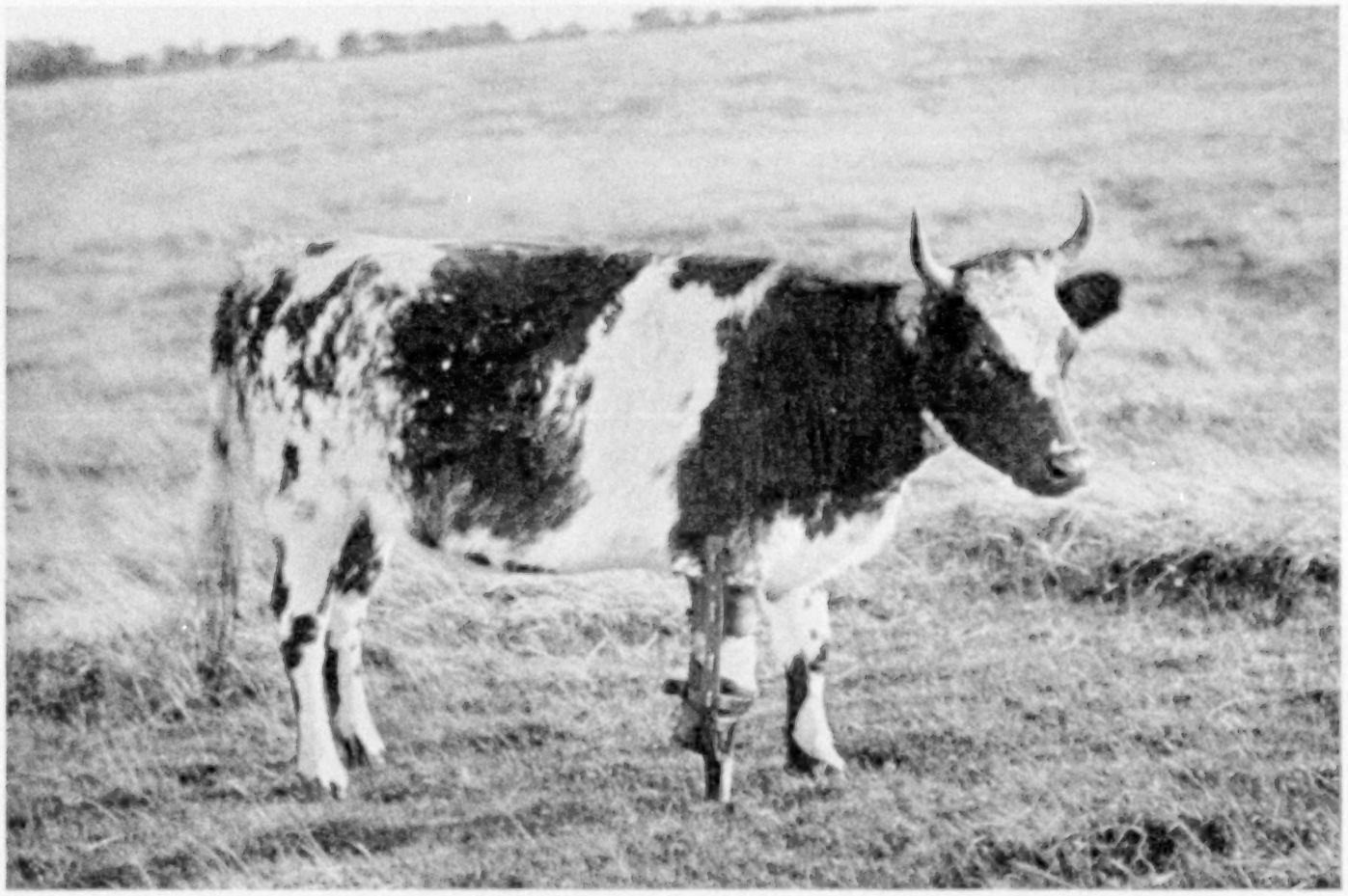
The narrow rails of steel which dissolve distance have not yet scaled the heights of the Himalayas or penetrated the depths of all their valleys, and the hardy, though ill-tempered, Yak still constitutes the Tibetan transportation system.

XUM

Photograph by William Reid

WEST HIGHLAND COWS AND CALVES

These animals, often called Kyloes in their native land, have been made familiar to the outside world through the art of Sir Edwin Landseer. They are a small, rough-coated mountain breed, having long horns. The original Kyloes were mainly black, but lighter colors—dun, red, fawn (and an occasional white with black points)—have since been established and are now preferred. They are essentially a beef type, and when fattened in lowland parks and feedlots produce a fine, though small, carcass of beef.



Photograph by Charles Reid

A PEG-LEGGED BOSSY

This cow broke her leg when young, and the owner, not wishing to see her destroyed, had a veterinary surgeon supply a wooden leg. She goes about in the fields with the other cows in dry weather, but when the ground is wet she has to stay indoors, as the wooden leg sinks in the earth and she is extricated with difficulty.

It was not until Robert Bakewell of Dishley, a Leicestershire farmer of an inquiring turn of mind and possessed of rare reasoning faculties, began his experiments in blood concentration as a means of definitely fixing desired characteristics that modern beef-cattle breeding received its first great impetus.

This was during the reign of King George III, and it is characteristic of the high consideration given even before that era, as well as at the present moment, by British royalty, nobility, and landed gentry to the improvement of the domestic animals of the kingdom, that His Majesty took a deep personal interest in Bakewell's work.

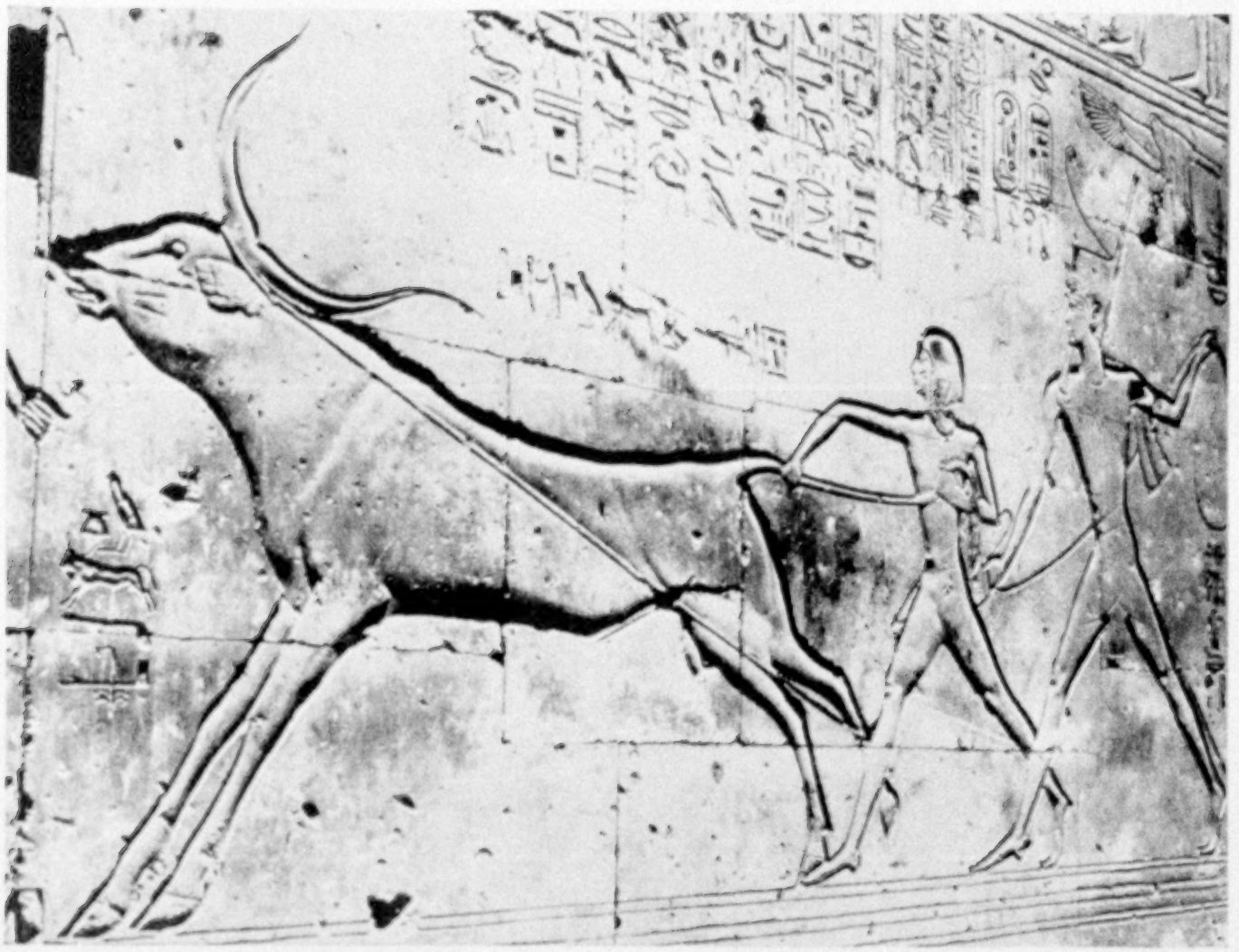
The good example thus set percolated down through the whole fabric of citizenship to the farmer himself!

The Dishley experiments were carried on with a long-wooled breed of sheep known as Leicesters, and with a type of cattle at that date (1755) locally popular in Lancashire and adjacent counties, under the name of Longhorns—so called because of their exceptional length of horn.

Bakewell's aim in the case of the Leicesters was not to increase the quantity or improve the quality of the wool, but to increase the amount of flesh in the carcass.

The principle that "like begets like" had long been accepted as a general truth, but Bakewell was the first to demonstrate that the close interbreeding of the offspring of animals possessing desired characteristics established a prepotency not otherwise attained. His object in the case of the Longhorns was the same as with the Leicesters—to produce a type carrying more flesh (and especially in the most valuable parts of the carcass) than the breed at that date possessed.

He sought beef, not milk, and by close mating of the progeny of animals selected because of their (as yet "unfixed") excellence in that direction, he accomplished his purpose. He found that breeding from close affinities tended to reduce size and



Photograph by A. Gaddis and G. Seif

A CARVING IN THE TEMPLE OF SETI I AT ABYDOS: EGYPT

Prince Amenherkhepshef and his father, Rameses II, are shown catching a bull for sacrifice. Such tail-twisting is still common among the Arabs of to-day, who accompany the "caress" with the shout, "Get up, sweetheart!"

vigor, and set up a certain delicacy of form which experience taught was favorable to the process of fat secretion, leading to earlier maturity than was the case with the unimproved prototypes.

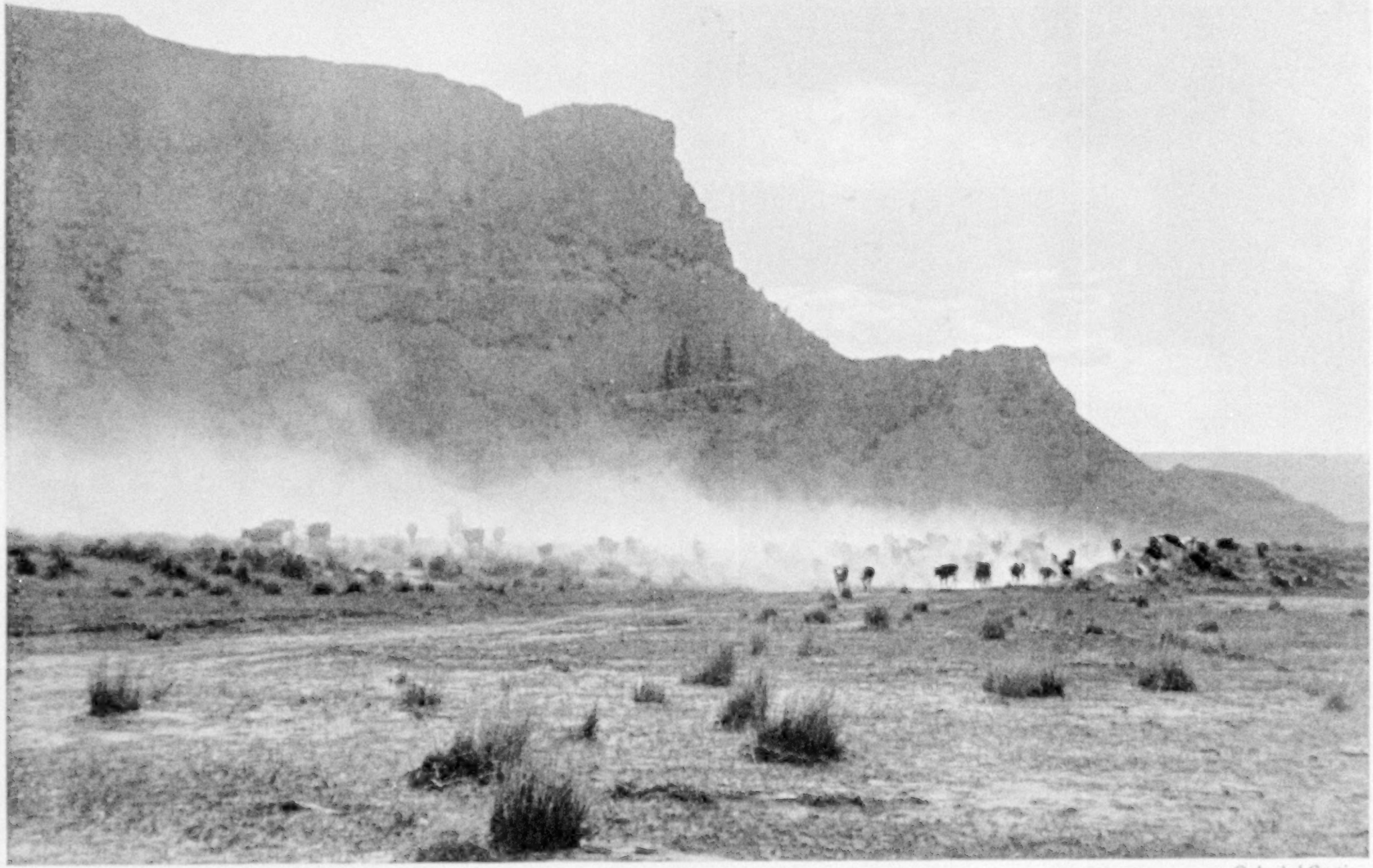
Bakewell's contemporaries who were engaged in producing the flesh-bearing breeds naturally were quick to apply the new policy; and if it enabled a breeder to establish early maturity and heavy-fleshing propensities, by parity of reasoning it would enable breeders of milking stock easily to accentuate udder development. In short, the principle was universal in its application and was resorted to in almost every branch of animal breeding as a sure and swift means of establishing any desired characteristic.

DIFFICULTIES AND HIGH ACHIEVEMENTS OF THE BREEDER'S ART

There is truth enough involved in Emerson's whimsical reference to Bakewell's work to emphasize sharply the artificiality of all "improved" breeds of animals. Such udders as are carried by our best modern dairy cows are unthinkable in the case of any normal specimen of the Bovine race. In a state of nature, no cow has any use whatever for the marvelous lacteal equipment fastened upon her by man's manipulation.

All cattle measuring up to the modern human idea as to what they *ought* to be are most assuredly *not* improved from the standpoint of the animals themselves. Hence the first thing that Nature undertakes to do for them, when man withdraws his supervision, is to begin restoring them to their ancient form.

An artist, modeling in plastic clay or conjuring with marble, brings forth a conception that the world acclaims a triumph. He deals, however, with his materials direct, and they respond instantly to his lightest touch, as he toils toward



© Asahel Curtis

A HERD IN THE FAR NORTHWEST

A cloud of dust rises as the cattle move forward on the floor of the Grand Coulée at the head of Steamboat Rock, formerly an island in the Columbia River.

a preconceived ideal. There is no resistance to his manipulations.

What, then, should be our estimate of the work of one who has first to conceive the figure in his brain; whose only tools are the laws of heredity, selection, inbreeding, outcrossing, and alimentation; whose only materials are flesh and blood, unapproachable except by indirection; who battles ever against the stubborn forces of atavism or reversion to ancestral forms; who seeks, and succeeds in producing, a creature pulsating with life, exquisitely fashioned, down to the minutest detail, not only a thing of beauty in itself—which artists try, sometimes with ill success, to reproduce on canvas or in bronze—but a creation that serves as well the highest utilitarian purpose?

The breeder of animals (or plants) directs the spark of life itself. The possibilities of his art are almost infinite.

CATTLE NOT INDIGENOUS TO THE WESTERN HEMISPHERE

No trace has been found of the existence of native cattle of any type in North or South America. The Bison was the only bovine creature found by the Spaniards during their explorations, and it was not what they were looking for.

Alvar Nuñez Cabeza de Vaca, treasurer of Narvaez's abortive Florida colony, and the first white man to cross the Continent of North America, was also the first to leave posterity a description of the Bison.

This explorer was shipwrecked in 1528 on the Texas coast, and after being enslaved by the Indians for almost six years, made his escape across Texas into Mexico (1535-6). Though he encountered no Bisons on his wanderings across this vast territory, being too far south, he had, however, met some of these strange animals probably near Matagorda Bay. Here, he says, the Indians "come up with the cows; I have seen them thrice and have eaten their meat." Then he goes on to describe the "cows," as to size, hair, and habitat.

About 1540 Mendoza, viceroy of New Spain, acting under instructions from the Spanish Crown, organized an expedition to search for the fabled "Seven Cities of Cibola," said to be located somewhere in the north, beyond the Rio Grande. Glowing tales of these had reached the ears of the king's representatives in what is now Mexico, and they determined to locate and, of course, exploit the reputed riches of those Indian capitals.

Francisco Vásquez Coronado, then governor of a province lying between the City of Mexico and the Californian Gulf, was chosen commander of the expeditionary force organized for this purpose, and, while disappointment, in so far as gold was concerned, followed his return after a prolonged absence, the fact remains that this proved one of the most important, besides being one of the most daring, explorations ever conducted upon this continent.

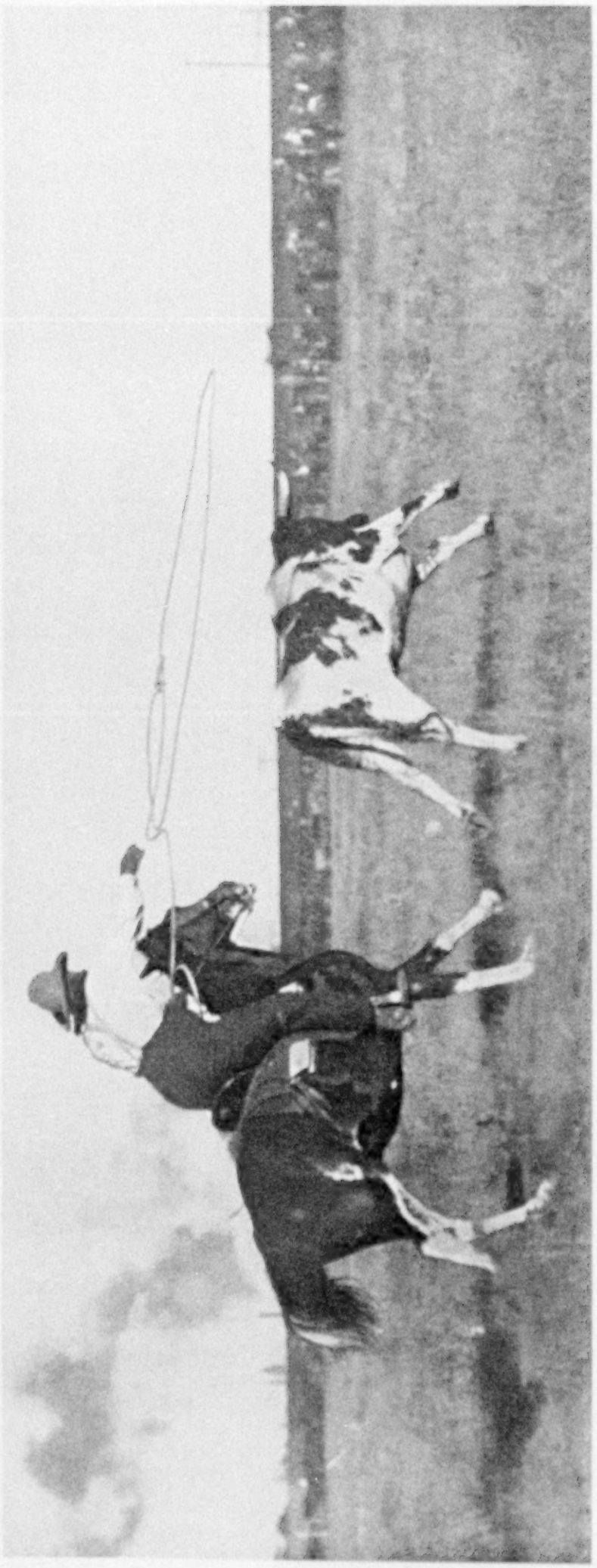
CORONADO'S "COWS"

Coronado proved to be the Columbus of the great uncharted sea of sand, sagebrush, and grassy, treeless plains that lie between the Grand Canyon of the Colorado and the lower reaches of the Platte. He passed through central Kansas as far north as the present Kansas-Nebraska border.

The Seven Cities were found in what is now the Zuñi Indian country of western New Mexico; but instead of treasures of precious metals, only a group of primitive villages, populated by peaceful aborigines, who grew maize and beans and melons and possessed little that could excite Spanish cupidity, rewarded the invader's long march from central Mexico. They "make the best cakes I have found." That was about all that Coronado seemed to think distinguished them from other southern Indians he had known.

So, after securing a few trinkets as souvenirs of the "Seven Cities," he listened to what proved to be grossly exaggerated tales of wondrous wealth existing toward the east; and, not proposing to return empty-handed, if this could by any possibility be avoided, he made his plans for extended explorations.

First, he had a small party reconnoiter westward, just to make sure that he had not been deliberately misled. Then another proceeded as far as the Grand Canyon, after which the expedition set its course squarely toward the rising sun. This brought Coronado presently out upon the Llano Estacado of our old geographies, and there he found the Bison.



© J. E. Stimson

THE FINE ART OF SWINGING A LARIAT (SPANISH "LA REATA") AS EFFECTIVELY PRACTICED ON UNRULY STEERS

The picturesque cowboy life which added so materially to the romance of years past on the Western plains has not entirely disappeared.

Fortunately, Coronado and his associates prepared, after their return, a detailed account of the great journey, which was subsequently published in Spain. From this we learn that "the only roads are those of the cows," and that "the cows are as numerous as the fishes of the sea!"

Thus the American Bison first comes conspicuously into the pages of our national history, and in this connection the account adds:

"There are bands of Indians who travel around with the cows, and do not plant, but eat raw flesh and drink the blood of the cows they kill; dressing themselves with the skins, and making little tents also of the hides."

COWBOY LAND

Cows are still in the region explored by Coronado, but not the cows of his time. They are not so numerous now as in the Bison days, nor as in the recent past. As a matter of fact, the red-with-white-face herds of Herefords one sees here and there as one whirls through the dry Southwest supply a more or less pathetic sequel to the greatest bovine epic of recorded history.

Behind those herds there is a story unparalleled in kind in any land, a story spectacular and dramatic, brimming with adventure and romance, replete with acts of heroism, as well as of crime, of fortunes quickly won and lost.

UM

Photograph by Sumner W. Matteson

FORDING THE MILK RIVER: MONTANA

On this ranch the sombrero, bandana, "chaps," and lariat of the typical cowboy have given place to more modern headgear and suspender overalls.

350

THE HOUSE OF THE BUTCHERS' GUILD IN NUREMBERG, GERMANY

The great stone ox was placed over the entrance to the Fleischbank (Meat Hall) in 1599.

The cowboy and the old-time Western "cattle king," as once known on the range, have long since passed from view; but we must make a detour to attain perspective.

Great herds of Longhorn cattle moving slowly northward from the Rio Grande for the prologue! The dashing hero-villains of the "movies," in picturesque array! The perils of the long, long trail! The night-alarm and call to saddles, as strange sounds or shadows in the darkness start the wild stampede! The cowland "capitals," where six-shooters flourished as the bottle and the "deal" went round! The branding and the round-up of the beef! Midsummer's burning suns and drouth! Midwinter's blizzards! Wolves waiting for their turn! Bleaching bones of cattle! Gambling for big stakes against elemental forces—all of these are constituents out of which the story is woven.

The Spanish Longhorns were first taken to Mexico in 1521 by Governor General Villalobos, and were calves shipped from Santo Domingo, descended from the cattle brought from Spain to the West Indies in the years immediately following the voyage of Columbus. These must have been succeeded by other shipments, for in 1538 Mendoza reported that cattle, horses, and merino sheep, which he had imported from Spain, were in good condition.

The early Spanish explorers of the country north of the Rio Grande, including Coronado, Fray Marcos de Niza, and Oñate, took horses, cattle, and sheep into that region, and these were undoubtedly the first of their kind upon what is now our Southwestern range.

All writers agree that the original cattle stocks multiplied rapidly in New Spain. That they invaded at an early date the fertile coastal plain, with its mild, even climate, extending from the mouth of the Rio Grande up along the western shore of the Mexican Gulf, may be taken for granted; but it was not until the Spanish authorities undertook the development of that country through a colonization policy that we find authentic records. This was about the year 1810.

When Texas became one of the United States, in 1845, and governmental affairs became more stable, the importations of first-class breeding stock, mainly Shorthorn, from Missouri, Kentucky, and other cattle-growing States did much to improve the Longhorn. It is unfortunate that few of the early writers took the trouble to give the characteristics of the old Longhorn-Spanish stock. About the only description recorded is that "they were a wild, fierce breed, with huge horns, long legs, and worth little or nothing to their owners."

The Longhorns (see Color Plate XX) were peculiarly adapted to the task of leading the great advance into the higher western latitudes and out upon the arid grazing grounds of the Staked Plain. They possessed amazing energy and endurance and had what may be termed "cow sense."

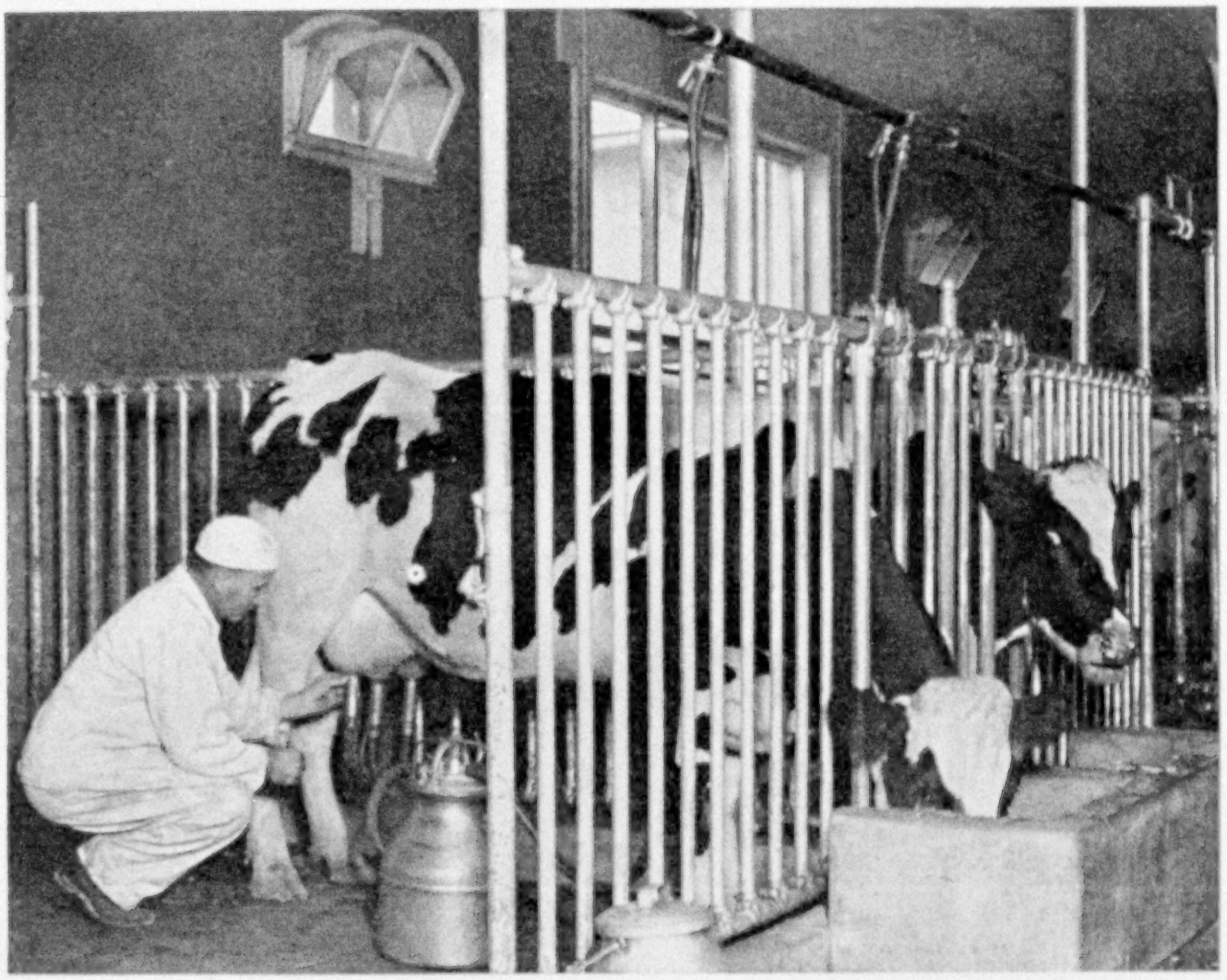
When bands of mixed cattle were common on the plains and deserts of the West, it is worthy of note that the Longhorns led the herds in their migrations. These cattle felt the "call of the wild," had weather wisdom, and knew where to find grass and water. They were admirable mothers, and their calves, sired by "Durham" or Hereford bulls, were excellent.

AN EARLY "CATTLE BARON"

Whatever may have been their faults, judged by the standards of latter-day beef-makers, it must be said that the Longhorns not only served every purpose required of them at the time, but constituted the best possible material for use by those who first sought to put cattle ranches on the map of our new possessions.

The extension of United States authority over the Lone Star State and the discovery of gold in California in 1848 resulted in an influx of population and capital that soon exerted a stimulating effect upon the production of cattle throughout southern and north-central Texas, as well as beyond the Sierra Nevada. The herds began to be valued for beef, as well as for hides, horns, and hoofs; and thus the infant industry of cattle-raising in a commercial sense came into existence in the Southwest.

Richard King, who had been a steamboat captain during the Mexican War, engaged in the transportation of freights



Photograph by Clifton Adams

AN ELECTRIC MILKING MACHINE IN USE AT ONE OF THE DAIRY BARNS OF THE SOLDIERS' HOME: WASHINGTON, D. C.

and supplies along the Gulf coast and up the navigable streams, was so impressed by the grazing possibilities of the region between Brownsville and Corpus Christi, Texas, that he obtained a tract of some 50,000 acres lying between the Rio Grande and Nueces River, which he at once stocked with horses and Longhorn cattle.

Upon this property in 1854 the headquarters of the once world-famous million-acre Santa Gertrudis Ranch was established and our modern American ranching had its earliest important exemplification.

Cattle and horses of the common Mexican types were purchased and roamed at will over the arid plain that had the brackish waters of the Nueces River for its northern boundary. In the meantime the proprietor made an outlet for his cattle by slaughtering them for their hides and tallow, which products he hauled to Corpus Christi, the nearest port on the coast.

The raising of cattle for their hides was so obviously a wasteful procedure that the attention of capitalists was drawn to the opportunity for profit afforded by such conditions. Before the outbreak of the Civil War two plants had been established near Rockport, Texas, at a place called Fulton. One was occupied mainly in canning fish and green sea turtle, but added a desiccating department for making beef extract. The other plant was the Coleman Fulton Packing Co., which packed beef in salt as pork is packed, but the main revenue was derived from corned beef. New York City capitalists, including "Commodore" Vanderbilt, are reputed to have had an interest in one or both of these concerns.

Captain King was soon joined in extensive cattle-grazing operations by his old companion in the coastwise steamship trade, Captain Mifflin Kennedy, who also acquired large holdings. Together they made rapid progress in their enterprises.

Numerous attempts were made to improve the quality of their herds, but little headway was recorded in this direction for many years. In the first place, there were no improved breeds nearer than the distant blue-grass pastures of Kentucky. Transportation was tedious and expensive, and, worst of all, it was soon discovered that Northern cattle taken to those Southern plains almost invariably succumbed to a fever the nature and origin of which were not understood at that time.

LONGHORNS WERE IMMUNE TO PLAGUE

The Longhorn thrived and multiplied untouched by the mysterious plague, but the Northern cattle either died or were left mere wrecks of their former selves. We now know that this was the work of the tick that infests the lowlands of the lower latitudes, against the toxins of which the native cattle were immune.

It was upon this same great Santa Gertrudis Ranch that the veterinarians of the United States Bureau of Animal Industry worked out in later years many of the problems relating to the so-called Texas, or splenetic, cattle fever (see page 631).

The early Mormon immigrants to Utah were instrumental in fixing the cattle stocks of that region, for these settlers took with them good milking cows, largely of Shorthorn blood. In the early eighties Utah still had many descendants of these valuable milch cows, and many a ranch was stocked with cattle bought in the Mormon settlements.

These animals had the habit of milk-giving too strongly pronounced to be ideal range stock, as the cows frequently lost parts of their udders from having more milk than their calves could take, and they were such persistent milkers that they were apt to go into winter too thin in flesh. They were, however, ideal mothers for the creation of grade Hereford herds.

OVER THE SANTA FÉ AND OREGON TRAILS

On the Pacific coast the situation was somewhat similar to that in Texas. In the extreme south the Spanish stock still prevailed in its natural state, but a steady stream of settlers from the Middle West, seeking their El Dorado at the end of the Oregon and Santa Fé trails, had driven many a beast of Shorthorn or Devon extraction across the Great Divide, where, under climatic conditions favorable to Northern-grown animals they had planted the seeds of substantial improvement.

Thus it came about that in both Oregon and California a start toward a higher standard had been made at a comparatively early period. In all these instances the cross of the Shorthorn on the Longhorn had increased the size, leveled the carcass, and improved the fleshing capacity of the cattle.

Texas has been well described as the hive from which swarmed the cattle that spread all over the region west of the Missouri River. Far removed from the devastating effects of the Civil War, the Texas herds increased, and the demand for beef for both armies added to their value. Then came the period of the trail herds to the north to reach the newly built transcontinental railroads.

BARBED-WIRE FENCING HAD ITS PART

So long as the Texas ranges were free and open to all comers, no general effort was made to improve the herds. About 1889, when the fight for "free grass" was lost, the State, which owned all its lands, began to issue leases or to make sales of land in large tracts, which the owners could inclose with barbed-wire fences.

Farsighted pioneer Texas cattlemen, like John Chisholm, Colonel Slaughter, Martin Childers, Burke Burnett, Ike Pryor, the Reynolds brothers, and many well-organized cattle companies, like the Continental ("Mill Iron") Co., the Matador, the J A (John Adair), the great Santa Gertrudis Ranch of Captain King, and last, but not least, the big Capitol Syndicate Outfit in the Panhandle (X I T), together with half a hundred others, not one of them owning less than 20,000 head of cattle, then began to breed up their herds.

Breeding was greatly stimulated by the demand for steers to stock up the open and unoccupied Northern ranges of Wyoming, Montana, Nebraska, and Colorado that developed so quickly after the late seventies.

The progressive ranchmen soon realized that it cost no more to raise a purebred than it did a "scrub"; the quieter, well-

bred steers ate no more grass and tramped out far less than did their Longhorn brethren.

When the Texas cattlemen awoke to the need of better blood, there arose at once the question of Texas fever and its deadly tick. As early as 1865 the records show that some mysterious disease followed the introduction of cattle from that State into States to the north. The trail herds that found their way across the plains to Abilene, Cimarron, Dodge City, Fort Hayes, and other shipping points along the new railroads in Kansas brought death to the local cattle.

Wherever the herds from Texas grazed across the Northern ranges local cattle died in large numbers. The Texans stoutly denied the charge that their cattle brought the disease, alleging that their stock was healthy, and that the losses were due to local conditions. So heavy were these, however, that the Northern stockmen took drastic measures to protect themselves. Trail herds reaching the Kansas State line were met by armed men, who refused the Texans passage across their ranges.

Not until 1891 was the cause definitely located, when Dr. Cooper Curtice, of the Bureau of Animal Industry, established the fact that a tick found on nearly all the cattle from Texas east of the 100th meridian, as well as on those of other Southern States below a certain line, carried the germs which caused the spread of the fatal fever. By a series of rotations in the use of pastures, the Government authorities began to clean up the Southern ranges with such success that the "tick line" has now been pushed far below the northern boundary of Texas and other Southern States, and eventually the whole region will be free from this disease.

"THE LAST OF FIVE THOUSAND"

Between the late seventies and the beginning of the present century the range cattle business had a marvelous expansion in the Northwest. In fact, during that period it reached its zenith and entered into a decline that culminated in the great financial debacle of 1923.

This development began with a heavy movement of Southern-bred "stockers" into Montana, the Dakotas, and Wyoming, filling the Great Plains region to the point of overstocking. Grass was free and the business for a time proved profitable. Capital was available in apparently unlimited amounts. Cattle-ranching became invested with a glamour that attracted adventurous spirits, Old World capitalists, and all sorts and conditions of men.

For a time all went well. Then came the greatest catastrophe the industry had yet encountered, the bad winter of 1886–87, which brought the whole great Northwest gambling structure tumbling to the ground. It was a period of Arctic severity that all but wiped out many of the leading operators.

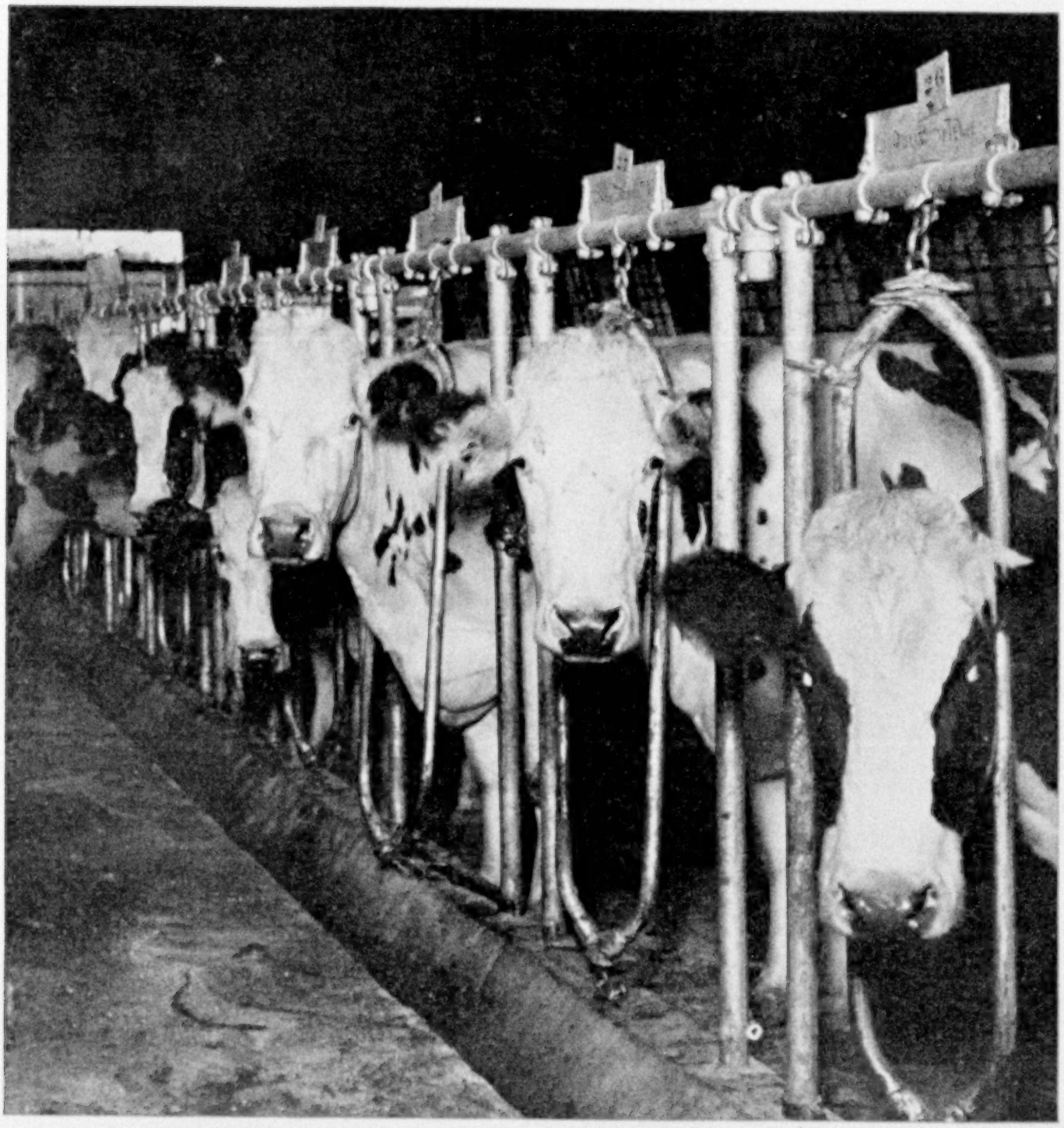
At the close of that winter "Charlie" Russell, later a noted animal painter, of Great Falls, Montana, who was then in charge of a big herd, was called upon for a report. He responded by drawing a picture which is to-day a classic in the cattle country. Underneath a solitary, emaciated steer, standing on a snow-covered mound and encircled by expectant wolves, he wrote, "The Last of Five Thousand!"

DRY FARMERS ROUT CATTLEMEN

Texas had plenty of cattle in those days for rehabilitation purposes, and capital came to the relief of the cattlemen, enabling them to restock. The business again entered upon a brief period of prosperity. The hardy white-faced Hereford had proved to be well adapted to the open range, and that blood to this day finds greater favor on the grazing grounds of the West than any other (see page 672).

During the period preceding this great disaster the entire Northwest, from the Missouri River on the east, the Niobrara on the south, to the Canadian line and beyond, was full of cattle, so full that the natural pastoral wealth of the region was fairly dissipated, due to overstocking, which inevitably heralded the decline of the industry.

Pastures were destroyed and settlers invaded the range—the advance guard of the army of dry farmers who in recent years have suffered so severely at the hands of implacable Nature. The latter, however, forced the big-herd owners to



Photograph by Clifton Adams

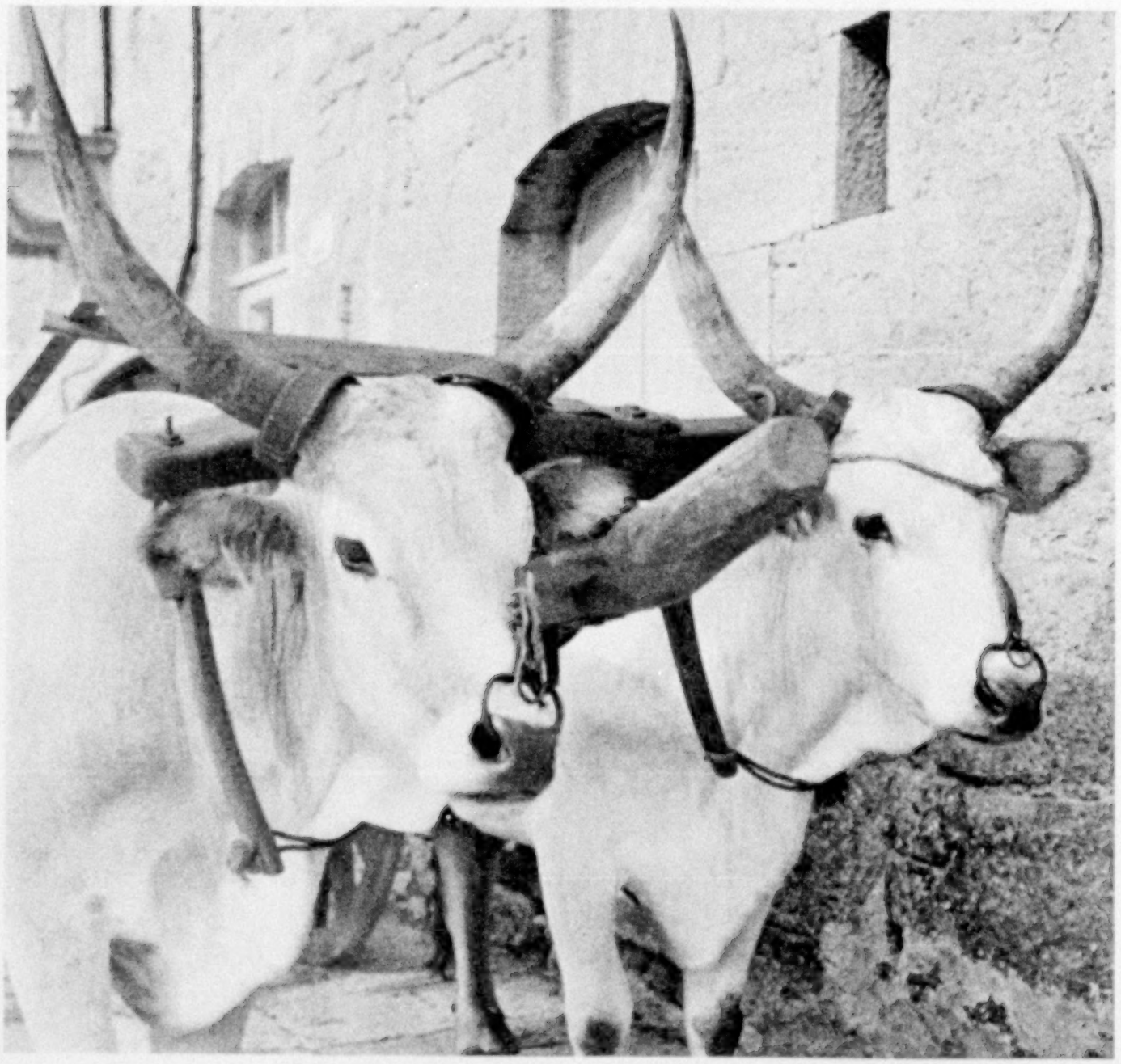
DEHORNED HOLSTEIN-FRIESIAN COWS AT THE U. S. SOLDIERS' HOME, WASHINGTON, D. C., WAITING TO BE MILKED

These generous producers trace their lineage back through generations of pure-bred ancestors. Each cow upon entering the big barn proceeds immediately to the stall bearing her name. The herd supplies milk, cream, and butter for the approximately 1,300 men resident at the Home.

withdraw by creating a condition in which it was impossible to make beef. Cattlemen resisted the inevitable, but the handicap was insurmountable. A few surviving big herds sought safety temporarily behind fences on Indian reservations, but even they are now passing out of the scene.

This period saw the development of the fenced-pasture area on the Standing Rock and Cheyenne reservations in North and South Dakota. Annual replenishment of these pastures was continued until 1923, when increasing overhead expense prevented the purchase of young cattle. Now it seems probable that the industry in the Northwest is to revert to a business of home breeding, under which the annual increase will be sold either at weaning time or at the yearling or short two-year-old stage.

Since the European war developments



Photograph by Donald McLeish

DRAFT OXEN OF THE REPUBLIC OF SAN MARINO

Practically all the roads in this tiniest of republics, with an area of only 24 square miles, have terrific grades, and the draft animals are necessarily powerful.

have been rapid. Commercial cattle have all but disappeared from the Great Plains, except where enjoying security behind fences.

THE DAY OF "BABY BEEF"

In the mountain regions the small herd has multiplied, and will probably feature the next chapter in the history of the industry. It may mean fewer cattle in the aggregate, but probably more beef, in consequence of better breeding and care, and a shorter production or maturity cycle. The new Western cattle industry will not be on a purely speculative basis, as was the old.

Early maturing as a factor in profitable beef-making has attained its greatest strides during the past 25 years. What was called the "behemoth bullock" was standard in the early days; now the pony steer has displaced it. The first International Live Stock Exposition carlot show at Chicago in 1900 presented hundreds of three- and four-year-old fat cattle. Now it is a display of yearlings, with a few two-year-olds.

In 1869 the display of Christmas cattle at Chicago included droves weighing up to 2,000 pounds. One has only to contrast these weights with the bulk of the show cattle now seen annually at Chicago to realize the enormous change that has occurred in market requirements.

Photograph by Camillo Schneider

HUNGARIAN OX TEAMS

It has been assumed that the Hungarian Ox is descended from the Giant Ox, or *Bos taurus primigenius*. He is large-framed, lean, and hardy, with great curving horns that sometimes measure full five feet from tip to tip.

The entire trend of beef-cattle production in the West has for 25 years been in the direction of "baby beef." The great old-time movement of Southern cattle to the Northwest is rapidly becoming a thing of the past. Southwestern range-bred calves of choice stock are being shipped in increasing numbers into Corn Belt feedlots for a rapid finish to meet the demand for fat, light-weight carcasses. The day of the aged grass-fed bullock has apparently passed forever.

THE COMING OF CATTLE TO THE ATLANTIC SEABOARD

The first important shipment of cattle to New England was in 1624, from Devonshire and adjacent counties, by Governor Edward Winslow, and this was followed up by subsequent importations consigned to "the Governor and Company of Massachusetts Bay." There is record also of the introduction into New Hampshire of some large yellow cattle from Denmark by Captain John Mason, and it is stated that 100 head of oxen of this type were driven into Boston in 1638, where they were sold for £25 per head.

The Connecticut River valley seems early to have attracted attention as a favorable field for stock-breeding, and it was near Springfield, Massachusetts, that William Pynchon, "the first American packer," began, about 1655, as a drover,

Photograph by Crété

A FRENCH OX TEAM THRESHING MACHINE

to take his cattle to the Boston market; by 1670 he was forwarding winter-fed bullocks.

STALL FEEDING BEGAN WITH PYNCHON

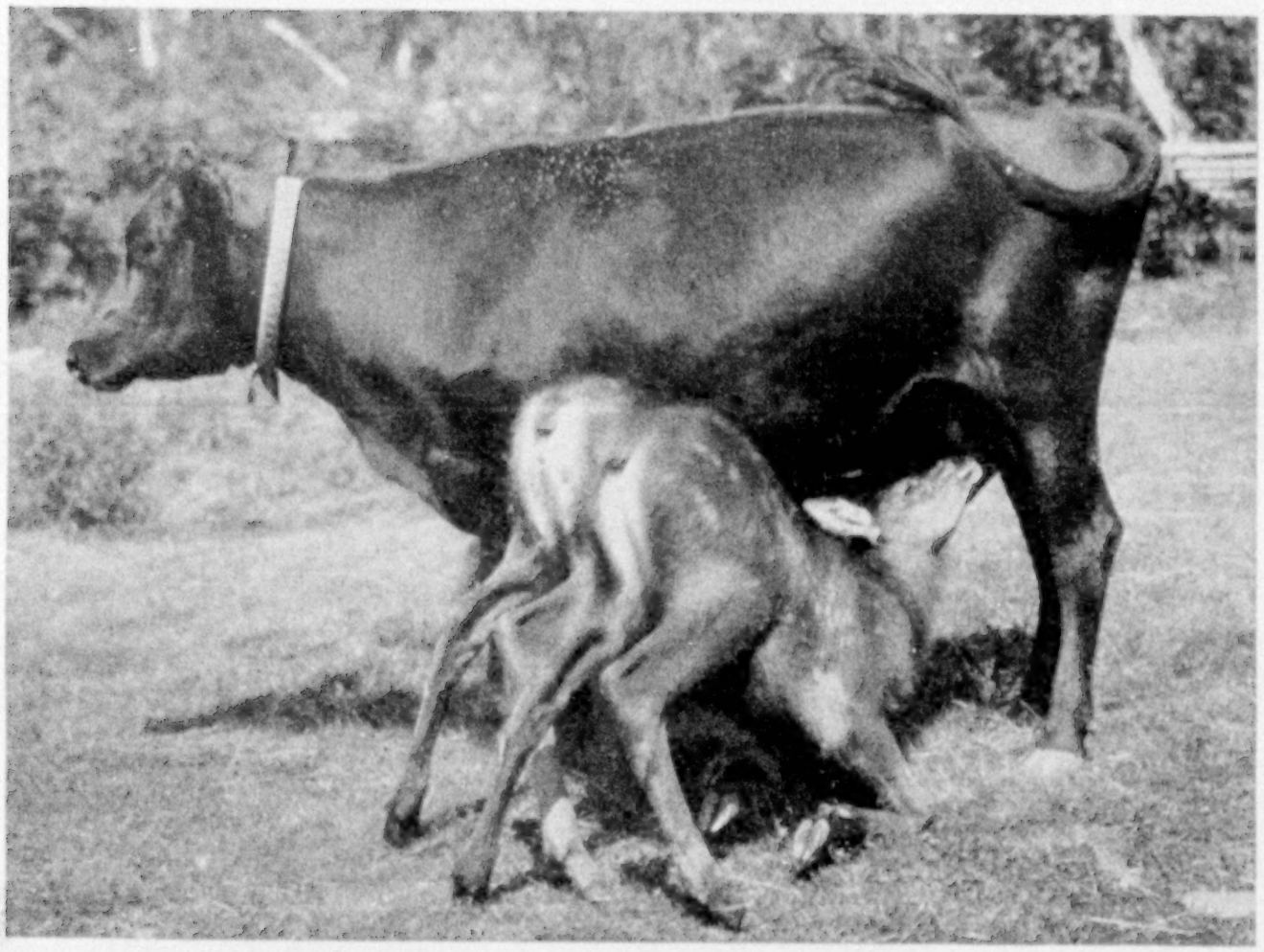
Stall feeding, it is believed, originated in America with Pynchon's operations. The original market place in Boston was the spot where the State House now stands, but in 1742 it was removed to Faneuil Hall. During the American Revolution an extraordinary bullock, weighing 2,270 pounds, is supposed to have "furnished a dinner for General Washington and all the officers of the army at Valley Forge."

The Dutch brought Holland cattle into New Amsterdam and grazed them for slaughtering purposes. Prior to 1676 the killing was done in the city, below Wall Street, and on the Brooklyn shore. By 1694 some 4,000 head were being slaughtered per year.

In Pennsylvania the cattle industry was firmly established prior to the War of Independence, and Philadelphia became the leading seaboard market. Both Quakers and Germans took kindly to cattle feeding, and a lucrative trade with the West Indies was developed.

In 1783 Messrs. Goff & Miller made an importation of Teeswater (Shorthorn) cattle into Virginia that laid the foundations in the valley of the South Branch of the Potomac River for the great business of making beef from Indian corn and blue grass in the United States. Descendants of these cattle accompanied the great emigration from the Old Dominion over the Blue Ridge into the rich pastures of the Ohio Valley, and it was not long before well-fatted droves of fine bullocks were being driven across the mountains to the Baltimore and Philadelphia markets, returning handsome profits to pioneers of Kentucky and southern Ohio.

In 1817 Colonel Lewis Sanders, of Kentucky, observing in an English agricultural newspaper that a bull called "Comet," of Shorthorn production, had been regarded as so valuable as to command at auction the then great sum of 1,000 guineas, placed an order for an importation of cattle to be chosen from the best herds of that day in the Teeswater Valley. These arrived and proved prolific, their descendants providing much of the material in later years for an extraordinary expansion in cattle breeding throughout the Middle West.



© Asahel Curtis

A FOSTER MOTHER TO ELK CALVES IN THE OLYMPIC MOUNTAIN REGION, WASHINGTON STATE

Kentuckians migrating into Indiana, Illinois, and Missouri took bulls of this blood into the heart of the Corn Belt.

Subsequent valuable importations into New York included those of Mr. Cox, of Rensselaer County; Samuel Hopkins, into the Genesee Valley, Major General Stephen Van Rensselaer, of Albany, and Charles H. Hall, a New York City merchant. Additional shipments into Massachusetts were those of Samuel Williams, a merchant then residing in London, who sent valuable breeding animals to his brother at Northboro, and Cornelius Coolidge, of Boston, who brought out cattle, the descendants of which were afterward sought in many States.

Colonel John Hare Powel, of Powelton, near Philadelphia, imported between the years 1822 and 1831 a large number of valuable Shorthorns that exerted far-reaching influence in later years among the herds of Pennsylvania, Ohio, and Kentucky.

An organization of southern Ohio farmers sent one of their own members, Felix Renick, to England in 1834 to bring out more breeding stock, and many valuable animals were safely transferred from Yorkshire to American pastures, proving a mine of wealth to the farmers of that period. Similar coöperative organizations of farmers were formed during the succeeding quarter century in Ohio and Kentucky, and large numbers of still better cattle were by this means made available in the central valleys of the Middle West.

It is interesting to note how perfectly all the various improved breeds now fit into their respective spheres. The place of the Shorthorn in bovine history is clearly defined. Outside of continental Europe it has rendered unequalled primary service in both North and South America. Its particular mission seems to have been the blazing of the trail for other types possessing outstanding adaptations to particular uses—beef-making as a business or dairying as a specialty.

There will always be scrub cattle found in the great spaces not suited to either intensive feeding for prime beef or for

XUM

Photograph by Charles J. Belden

ALL ABOARD FOR THE STOCKYARDS

Cowboys are loading range cattle onto the "livestock pullmans" that will carry them to the stockyards, where in short order they are converted into dressed beef.

highly organized dairying, and in that fact is found the perennial demand for the dual-purpose breeds. Under European conditions this field is occupied by such Continental types as the Normandys, Simmentals, Friesians, and various grades and crosses seen in Belgium, Germany, the Danubian regions, and northern Italy.

ADVENT OF GREAT DAIRY BREEDS

The Holstein-Friesians, Jerseys, Guernseys, Ayrshires, Brown Swiss, Devons, and Red Polls are now conspicuous in every leading dairy State. Thousands of these have been transferred during the past four decades from Old World pastures to American farms, to the vast betterment of the national supply of dairy products.

The Department of Agriculture reports that in 1923 some 25,000,000 dairy cows converted various forage crops consumed into $2,500,000,000 at the farm! Not only that, but the manufacturing of butter, cheese, condensed milk, milk powder, and ice cream, together with the pasteurization and distribution of fluid milk for city consumption, added at least $1,500,000,000 more to the retail market value of the dairy cow's contribution to the country's total wealth.

The farm value of dairy products is reported as equaling the combined values of the cotton, wheat, and potatoes grown that same year! And the dairy cow's popularity grows apace.

"THERMOS-BOTTLE" CARS

In the rehabilitation of Northwestern agriculture, now in progress, the claims of the milk breeds are finding widespread recognition, and the demand from that quarter is greater than the available supply of proved profit-producing cows. Friends of the industry find in that fact cause for some concern. Here, as in all other lines of animal husbandry, it is of first importance that foundation stock be

sound in body and efficient converters of foodstuffs into cash.

The recent perfection of that giant "thermos bottle," the glass-lined tank placed on automobile trucks, and later in still larger sizes in railroad trains, is introducing a new influence tending to redistribute the source of milk and cream supply for cities, lessening the advantage of the near-by product, with a growing tendency to equalize the difference in price between the so-called fluid milk territory and the more distant factory territory.

The great majority of the dairy cows in America are in the northeastern quarter of the nation. While the center of human population is in southwestern Indiana, the center of cow population is considerably east and north of this point. The greatest dairy development has followed that section of the country just north of the winter wheat area, lapping over into the northern edge of the Corn Belt area, where early frost frequently overtakes the corn crop.

A national survey of the cow population at the close of the World War disclosed that cows kept to supply cities with milk are owned in the territory tributary by rail to great centers of population, while those supplying the cheese factories, creameries, condensers, and milk-powder plants are located in the great central and northwestern parts of the United States and increasingly in all States.

The leading States in cow population, according to the latest census, are, in round figures: Wisconsin, 1,800,000; New York, 1,500,000; Minnesota, 1,200,000; Illinois, nearly 1,000,000; Iowa, 900,000; Ohio, just a few less, with Pennsylvania, Texas, and Michigan closely following.

PROMOTING AN ESSENTIAL INDUSTRY

The United States Government, through the Bureau of Animal Industry, safeguards the health of our herds, not only by the enforcement of restrictive or exclusion orders against the introduction of cattle from countries where contagious diseases are known to prevail, but maintains a rigid inspection of packing-house operations, and copes energetically and efficiently with all outbreaks of virulent communicable bovine plagues.

The formation of boys' and girls' calf clubs in the various States has gone forward vigorously in recent years, and with far-reaching results in spreading the gospel of the value of good blood. The rising generations of the farm are everywhere vying with each other in keen contests, under expert guidance, as to who can obtain the best results.

The practice of selling surplus pure-bred pedigree stock or dispersing entire herds by resort to auction sales has become an established procedure, and such events attract the attention of all who are desirous of acquiring breeding animals upon the basis of honestly conducted public appraisal.

THE END OF THE TRAIL

The object of all breeders and owners of well-bred cattle is the banishment of the unimproved, unprofitable scrub that is everywhere in evidence.

In coping with the problems of farming in our country, increasing attention must be devoted everywhere to well-bred cattle. They are not, as many erroneously imagine, mere "playthings" for wealthy owners of landed estates.

Those who maintain fine herds mainly for the pleasure they derive from the interesting pursuit of animal breeding are rendering the country a most substantial service, for the herds thus maintained are really our most important nurseries of seed stock, which ultimately finds its way into the fertile fields of everyday, practical farm operations.

Improved breeds, as already shown, are in the highest degree artificial, as compared with their remote progenitors, and if, through lapse of interest in their perpetuation, they were to be thrown back upon their own resources, they would either perish outright or revert, within a small fraction of the time it has taken to bring about their evolution, to unimproved ancestral types.

An intelligent individual interest in their continued maintenance is, therefore, the patriotic duty of every citizen, whether directly concerned with agricultural prosperity or engaged in other occupations, all of which, at bottom, find support in the well-being of those who live upon the land.

XUM

THE GAUR (Bos gaurus)

(For illustration, see Color Plate I)

Bos gaurus is the scientific name generally given to the most magnificent of the wild oxen of the tropical East, although there are probably two or three different species or varieties. In India it is commonly, though erroneously, called the Indian Bison. In Indo-China and the Malay States the name of Seladang (Saladang, Sladang) is often applied to these wild cattle. Sometimes they are referred to as the Aurochs, probably because of their extraordinary size and a supposed general resemblance to the so-called Aurochs (*Bos taurus primigenius*) of ancient Europe.

In view of the confusion that has arisen through the interchanging of the terms Urus, Aurochs and *Bos (taurus) primigenius*, it may be well in passing to state that there once existed in the Hercynian and Sarmatian forests what is supposed to have been the largest and fiercest of all quadrupeds indigenous to Europe proper—the wild *Bison Europæus*. There also existed another large animal distinctly *not* of the Bison group, but of *Bos taurus* classification, known to the Greek and Roman writers as the Urus (see, also, text, page 645). This animal was termed by the ancient Teutons Urochs, or Aurochs, the word being derived from *Ur* (a root found in many languages, and signifying original or old) and *ochs*, an ox.

The Greeks either borrowed the word Urus from the Germans or derived it from the same root *Ur*, used in the composition of their own word *taurus*.

In the course of time the error of confounding the European Bison with the Urus became so common that Pliny and Solinus both pointedly corrected it. Laurentius likewise says: "In Lithuania there are Bisons, Uri, and Elks; those are in error who call the Bisons Uri; for the Bisons differ from the Uri which have the form of an ox, in having manes and long hairs about the neck, in having a beard hanging from the chin and in smelling of musk."

In the Middle Ages Albertus Magnus and others fell into the error of confounding these animals, and several German writers applied the term Urochs or Aurochs, the real designation of their own Urus, to the Bison. Certain modern naturalists seem to have fallen into the same error. This being the case, it is obvious that the employment of the word Aurochs in any discussion of the ancient wild bovine types, not only of Europe but of Western Asia, is not in the line of accuracy from scientific standpoints. The expressions *Bos urus* and *Bos (taurus) primigenius* are interchangeable, and are not susceptible of misinterpretation.

The Gaur bulls often stand six feet high at the shoulder, and a few considerably taller ones have been reported. The males are of massive build, reaching a much larger size than any other species of the Bovidæ. The females are in all proportions considerably smaller than the males.

The long, upstanding spines of the vertebræ produce an outstanding ridge above the shoulders. The dewlap is small and inconspicuous, while the ears are proportionately large and noticeable. The tail is relatively short, the tufted end hanging scarcely to the hocks.

The horns of the bulls are massive and heavy, reaching a length of 30 to 39 inches, with basal circumferences of 15 to 20 inches, and are yellowish or greenish in color, with black tips, upward curving and decidedly flattened at their bases.

There is a "high convex ridge on the forehead between the horns," which extends forward, making the upper part of the face bulge out, thus causing the profile to give the impression of a dish-face.

As the bulls reach old age their color becomes dark brown to black, the crown of the head remaining gray. The lower part of the legs is entirely white, and for this reason they have been referred to as the "white-booted cattle."

Gaur cows are lighter in color than the males and are reported in some cases to show a tendency toward redness. It has been noted that the calves have a brown or dark stripe extending along the median dorsal region.

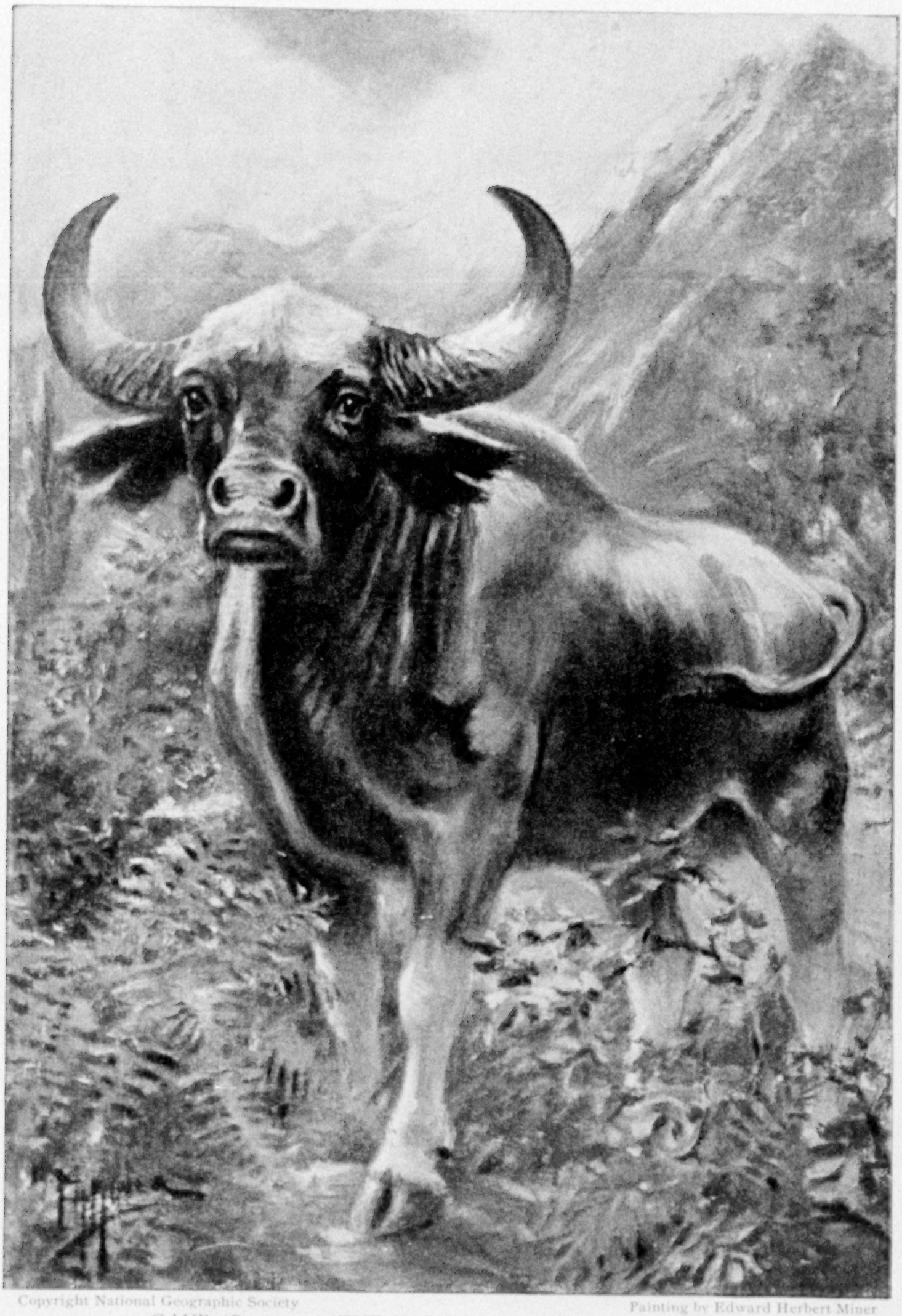
Sports writers grow more enthusiastic over the Gaur than over almost any other animal. They have a stately and magnificent carriage. "The enormous size of the bulls, their fine proportions, noble head, grand incurving, olive-green, black-tipped horns, blue eyes, and the short, sleek olive or blackish-brown coat of both sexes, all combine to render it the superb and peerless member of the ox tribe." Although he considers it a very fine animal, Mr. Kermit Roosevelt, who has recently hunted the Gaur in Mysore, is not sure that he would give it precedence over the African Buffalo.

In small herds, the Gaur ranges throughout all the larger forested parts of India, up into the lower reaches of the Himalayas, into the higher regions of Assam and Burma, throughout the northern parts of the Malay Peninsula, and over into Indo-China. It is not found in Ceylon.

While roaming widely, the Gaur holds to the brush or jungle, and has the reputation of being the most alert and cunning of all the animals of the chase. The bulls are not pugnacious unless wounded or brought to bay, when they become most dangerous and formidable. They are even reported to have met the tiger in close matches.

Only a few Gaur have ever been reported as domesticated, and these only partially so by the semiwild hill tribes in eastern India, where they associate with the Gayal (*Bos frontalis*), which has long been more or less domesticated. In fact, the Gayal and Gaur are closely related and were formerly classed as belonging to the same species.

In the Malay Peninsula the Gaur (Seladang) is classed by naturalists as the variety *B. gaurus hubbacki*. There they resemble the Gayal as much as they do the Indian Gaur. Since it is known that captive Indian Gaur cross with the Gayal in the hills of eastern India, it is not unlikely that there are all kinds of connecting varieties, hybrid for various characters, between the two. The Burmese Gaur (*B. gaurus readi*)



Copyright National Geographic Society

Painting by Edward Herbert Miner

GAUR (*Bos gaurus*), THE NATIVE WILD OX OF EAST INDIA

is also most likely a hybrid complex between the Gaur and the Gayal or some other group with which it crossbreeds.

It must be kept in mind that few, if any, of the species or races of cattle are sharply delimited, as they have wide ranges of crossbreeding. In fact, it appears that there are very few species or breeds of cattle that do not crossbreed with most others.

THE BANTENG (Bos (Bibos) sondaicus)

(For illustration, see Color Plate II)

The Banteng, or Banting, sometimes called Sapiutan, inhabits Java, Borneo, the Sunda Islands, the Straits Settlements, and southern Burma, where it is known as the Tsaine, or H'saine (*B. sondaicus birmanicus*). Its range also extends into India on the west and into Indo-China on the east. It is distinguished by a conspicuous white rump, and the lower legs are white below the hocks. The bulls are black, except that the Tsaine in Burma is rufous fawn. The cows and young are rufous, the calves having a brown stripe along the back.

There are many tame Banteng, and in the Lesser Sunda Islands they are reared in considerable numbers and exported to Singapore, where they furnish the principal beef supply.

The Banteng is frequently referred to as a local race of the Gaur of India (see page 638). It is somewhat smaller and the head is long and more slender. The horns are less angular and sharper and the dorsal ridge is not so prominent. The Banteng has a large dewlap, as contrasted with that of the Gaur. It sometimes reaches a height, at the shoulders, of five feet. One specimen was reported as being five feet nine inches high at the withers. The tail hangs considerably below the hocks.

In addition to other resemblances, the calves of the Banteng have almost the same kind of dark-brown stripes down the back as do the young of the Gaur. In eastern India, where it is commonly domesticated by the semiwild hill tribes, the Gayal crossbreeds with the Gaur and the Banteng. As a matter of fact, the three are very closely related and, with their several varieties, make an almost continuous series with the Zebu, or Brahman (*Bos indicus*), on the one end and the extinct Aurochs (*Bos taurus primigenius*) on the other.

According to Rütimeyer, as interpreted by Lydekker, the Zebu was derived from an Indo-Malay group of cattle and most probably from the Banteng itself.

Much confusion exists in many accounts as to whether the Banteng belongs to the Gaur or the Gayal group. It has comparatively longer legs than the Gaur and is, therefore, less likely to climb over rocks and up steep hills, being more restricted to the plains. The domesticated Banteng breeds freely with the Zebu.

THE YAK (Bos (Poëphagus) grunniens)

(For illustration, see Color Plate III)

The wild Yak, indigenous to the highlands of central Asia, belongs to the Bisontine group of the Bovine creation, and in common with other Bisons his voice resembles the grunting of swine; hence naturalists have fastened upon him the designation *Bos* or *Poëphagus grunniens*. In his wild state his habitat was chiefly the high mountains separating India from ancient Tartary.

In his domesticated state the Yak is regarded as a cross between the wild Yak and some bovine type of Taurine derivation. There is a well-recognized relationship between the Gaur, the great wild ox of Asia, the Yak, such East Indian humped Bibovines as the Gayal and Banteng, the various Buffaloes, the Bison, and cattle proper.

Herds of wild Yak have occasionally been found at altitudes of more than 16,000 feet in the Himalayan heights. The domesticated variety is the trusty servant, not only of the Tibetans, but of tribes inhabiting Kashmir and Mongolia, being valued as a beast of burden as well as for its rich, yellow milk. The skin is often used for clothing among the Tibetans.

Its extraordinary growth of hair—a legacy of a hardy, high, snow-covered-mountain-ranging ancestry—is perhaps the Yak's most distinguishing characteristic. It grows so luxuriantly over the shoulders as sometimes to be mistaken for a hump. Rugs and strong cloth are woven from it, and the long-flowing tail is put to various uses, as, for instance, the "chowries" or fly-flaps of India.

A most interesting experiment is being carried on by the Department of Agriculture of the Canadian Government in crossing the Yak upon domesticated cattle. Hybrids partaking of certain characteristics of both parents are now coming to maturity and will be subjected to further crossing. This experiment was suggested by the successful mating of Bison bulls with domestic cattle, as carried out in Kansas some years ago—the progeny being called "Catalo."

BRAHMAN (ZEBU) CATTLE (Bos indicus)

(For illustration, see Color Plate IV)

Over much of Asia and Africa is found a type of cattle presenting certain marked differences from the cattle of America and Europe. These differences are characterized by a fleshy hump above the shoulders, an extreme development of loose skin along the entire underside of the neck, and a similar pendent condition of skin about the navel, more especially marked in the males; a short, steep rump and comparatively long legs.

The head is long and narrow, from the sleepy-appearing eyes to the muzzle; the ears are very long and often are carried in a drooping manner; the horns differ widely, according to sex and breed, but with the males they are usually very large and long. The color of the hair, which is short and fine, ranges through various shades of gray to brown. The hoofs are black and the skin color ranges from brown to black, according to breed.

These humped cattle have long been known in Europe under the name of Zebu, although, according to Lydekker, how the word originated

and by whom it was first employed in literature have not yet been determined.

The native home of these cattle has been assumed to be India, and there they are kept in large numbers, where they are used as beasts of burden and for meat and milk. White bulls of the breed are regarded as sacred by the Brahman caste of India, being associated with their Hindu divinity, Brahma.

There are many different breeds of these cattle in Asia and Africa. They vary in size, development of hump and pendent skin, form and size of horn, and color. These breeds derive their names from the localities in which they have been bred and developed. However, they do not show the careful breeding characteristic of the improved breeds of America and Europe.

The Zebu of India has been introduced into the United States under the name of Brahman, which has been officially adopted as the preferred form by the United States Department of Agriculture.

The Brahman cattle have long been familiar at circuses and in zoological gardens, but the first recorded importation to America was that of Dr. J. B. Davis, of South Carolina, in 1849. Following this, from time to time small importations were made to the south and southwestern United States. In 1906 A. P. Borden imported 51 head from India to the Pierce Estate, in Wharton County, Texas. During the last quarter of a century especially, Brahman cattle have been crossed in a limited degree on other cattle in certain herds along the Gulf coast of Louisiana and Texas. Through crossing, the hump has been more or less removed and the value of the crossbred carcass for beef is much improved over the parent Brahman stock.

Advocates of these cattle and their crosses in the United States especially emphasize their freedom from ticks and southern fever and their ability to withstand heat and drouth in a very hot climate. A Brahman Cattle Breeders' Association was organized in Texas in March, 1924.

PODOLIAN CATTLE

In a district of southwestern Russia known as Podolia (Podolsk), and in Hungary, we find a breed of cattle known by the name of Podolian. In Hungary it is also termed the Gray or White Hungarian. It has been assumed that these animals are descended from the Giant Ox, *Bos taurus primigenius*. In 1903 Professor Charles Monostori, of the Royal Hungarian Veterinary School at Budapest, wrote in *The Breeder's Gazette* that the breed was 1,000 years old and was extensively bred in Hungary.

The following are the essential features of the breed: The typical animal is large of frame, lean and robust, narrow-chested, heavy of dewlap, and long of leg. The color is a light or dark gray. The horns are the longest among existing breeds of cattle.

Mature cows stand about 56 inches high at the shoulders, and bulls at 60 inches, the former weighing about 1,200 pounds and the latter 1,850 pounds. The Podolian is naturally very active of foot, and hence is most highly regarded for draft purposes.

In milk production the breed ranks as very inferior, although a number of breeders have brought marked improvement in this respect, and cows have been known to produce in a year 2,000 quarts of milk testing 2.6 per cent fat. These cattle are extremely healthy and epidemic or contagious maladies among them are not known to have occurred.

Lydekker states that this breed, which ranges through Hungary into Turkey and southwestern Asia, is represented by two strains, one characteristic of Hungary and the other of Transylvania. In both types the bulls have the general pale-drab color of the short coat, relieved by black markings on the muzzle, dewlap, and certain other parts of the head and body, and the black tail tuft, while the lower portions of the legs show more or less white.

The horns of the bulls, which are beautifully shaped and symmetrical, are long and somewhat doubly curved, with an outward, upward, and finally backward direction; they are black toward the tips, but elsewhere grayish white. Those of the cows are much more slender, with a more pronounced backward inclination at the tips. Longest of all are those of oxen, which may measure fully five feet from tip to tip.

The bulls of the Hungarian strain are heavier animals, with a fuller dewlap than those of Transylvania.

In Italy, especially in the district about Rome, one will see large, silver-gray cattle, with great horns, muscular and lean of flesh, commonly used for draft purposes. These are known as Roman or Campagna cattle, and, although bred for many centuries in that country, they are no doubt closely related to the Podolian.

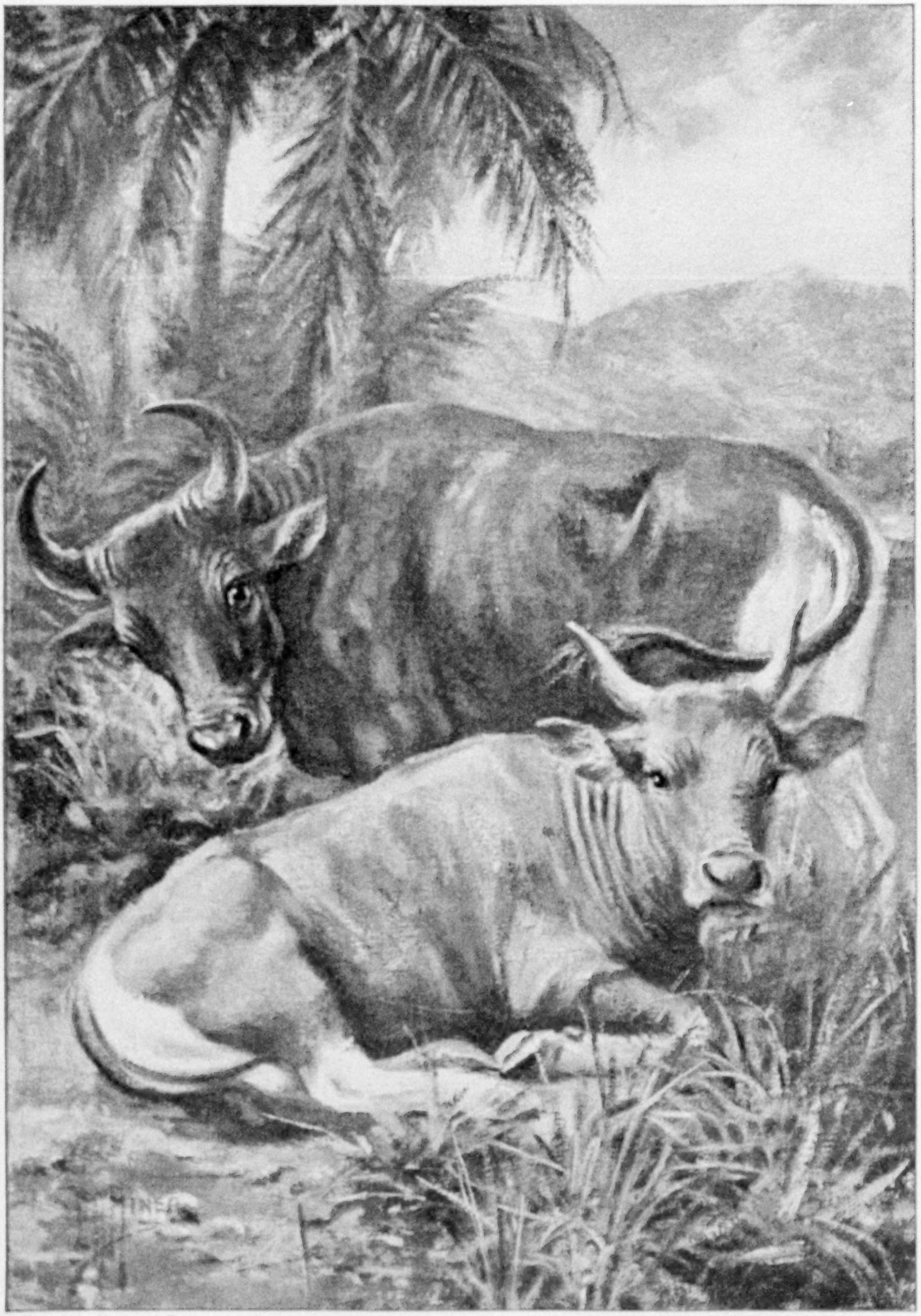
THE INDIAN (WATER) BUFFALO
(Bos bubalus)

(*For illustration, see Color Plate V*)

In the wild Indian (Water) Buffalo, from which the domesticated Buffaloes are supposed to be descendants, the male is distinguished by a greater proportionate length of the head, the profile of which is nearly straight. The center of the forehead is distinctly convex. The sockets of the eyes in the skull are very large and the nasal bones are of considerable length. The ears are comparatively small, with relatively small openings, and the fringe of hair on their edges is thin.

The long, triangular, flattened, transversely wrinkled horns are very prominent. "They taper gradually from root to tip and generally curve regularly upward, outward, and a little backward from the line of the face in nearly a single plane, the tips bending inward and slightly forward" (Lydekker). There is another type in which the horns extend directly outward and turn up only near the tips. The horns of the cows are relatively longer and thinner and not so strikingly triangular as those of the males, and they point more straightly outward.

The color of both sexes is black or ashy,



Copyright National Geographic Society Painting by Edward Herbert Miner

BANTENG (*Bos sondaicus*), THE NATIVE WILD OX OF THE MALAY PENINSULA

Copyright National Geographic Society

Painting from life by Edward Herbert Miner

YAK (*Bos grunniens*), THE NATIVE WILD OX OF TIBET

and below the hocks they may be light gray to white. Some individuals are nearly dun, probably due to an admixture of a dun-colored variety from northern Assam. They never have a thick coating of hair and the old animals become almost bare.

The males are reported to reach a shoulder height ranging from five to six feet, though one experienced hunter, General Kinloch, doubts if they ever reach a height greater than five feet four inches (sixteen hands). One individual, which was five feet in height from the shoulders, had a length of nine feet seven inches from the nose to the root of the tail, the tail measuring three feet eleven inches, and the girth of the body was eight feet three inches.

The true wild Indian Buffalo is found mainly in the neighborhood of swamps, in tall-grass jungles. It is not found in a truly wild state in any other country than India. It inhabits the plains near the Ganges and Brahmaputra and up into the foothills of the Himalayas, and occurs near the coast in Midnapore and Orissa, and in the eastern portions of the Central Provinces, and in northern Ceylon.

The herds found running wild in Burma and in the Straits Settlements are supposed to have descended from animals that escaped from captivity. The Buffalo is not now found in the real wild state west of the Indus, but in the pre-Christian Era it appears to have ranged over into Mesopotamia, according to Durst. However, even if the Buffaloes of Egypt and northern Africa did originate from the wild Indian form, they may not have been derived from the ancient Babylonian wild Buffalo, but from later importations of domesticated breeds from India.

About the same degree of obscurity shrouds the origin and distribution of the various breeds of Buffaloes in Asia and Europe as that which conceals the beginnings of domesticated animals in general. Even in India there are at present many more or less well-defined local breeds distinguished by variations in build, size, horns, and other characters. None of these breeds, however, differs from the wild type so much as do the many breeds of Western cattle.

The wild Indian Buffalo is found mainly in the tall-grass jungles, usually where there are swamps, though it may be found in the more open country and occasionally even in the forests. The grass in the normal habitat grows so tall that herds of Buffaloes have tunneled, as it were, through it. The hunter may approach within a few feet of an animal or herd and not get a glimpse.

The Indian Buffalo, according to Lydekker, feeds chiefly on grass, in the evening, at night, and in the morning, and generally lies down in high grass, not infrequently in a marsh, during the day. It is by no means shy, nor does it appear to shun the neighborhood of man, for it commits great havoc among growing crops. Sometimes a herd or a solitary bull will take possession of a field and keep off the men who own it. In fact, Buffaloes are by far the boldest and most savage of the Indian Bovidæ.

Tame as well as wild Buffaloes spend much time in the water. It is supposed that, because they do not appear to perspire to any great extent, immersion in water or the frequent wetting of the skin functions in regulating the heat of the body. However, it is observed that the tame Buffaloes, not only of India, but of all the Orient, are often worked for long hours in the heat and without a bath.

Water Buffaloes are widely distributed in Asia and Europe, are used as beasts of burden, and furnish both meat and milk.

CATALO

The word Catalo (Cattalo) appears to have been first proposed by C. J. (Buffalo) Jones, who was born in Bloomington, Indiana, in 1844 and died in Topeka, Kansas, in 1919. "The new animal I called the Catalo," he says, "cat for the first letters of cattle and alo, the last letters of buffalo." This is the way it is frequently spelled in the dictionaries, though Colonel Charles Goodnight and some writers have used two t's, making it Cattalo (sometimes Cattalow). The term is usually applied to any of the grades as long as they trace back, however remotely, to the Buffalo.

The name Catalo appears to be reserved for the hybrid offspring from crosses of the American Bison, or Buffalo (*Bison* (*Bos*) *americanus*), on cattle (*Bos taurus*). The very fact that the Bison and cattle cross and produce fertile offspring raises the question as to the propriety of placing the two in separate genera or even separate species. The cross has been made by C. J. Jones, Colonel Charles Goodnight, of Texas; Mossom M. Boyd, of Bobcaygeon, Ontario, Canada, and by the Canadian Government.

It appears that both sexes of first hybrids have resulted from some of the crosses, but Colonel Goodnight has always insisted that male first hybrids have never been born alive in his experiments. It is not due to the hump, or size, but probably to some physiological feature that the male hybrids do not usually survive the period of birth.

Neither Colonel Goodnight nor Buffalo Jones kept dependable records of their experiments. It cannot even be determined, from their statements, who first succeeded in securing a Catalo. Jones began at some time after "having lost two-thirds of my domestic calves by a severe blizzard during the winter of 1885-6." Goodnight's first two hybrids were born in 1888.

It is not improbable that Bison and semiwild cattle had crossed previously. There are anecdotal accounts to the effect that even in Revolutionary times Buffalo-cattle crosses were made. However, on account of the difficulties of mating and the frequency of failure during gestation, it is not likely that extensive crossbreeding occurred.

The crossbreeding of the European Bison (*Bison* (*Bos*) *bonasus*) with cattle has been effected in the Halle Zoological Gardens, and elsewhere in Germany, and at one of the Russian Government experiment stations in the Crimea.

Great honor is due Colonel Goodnight and Buffalo Jones for their enterprise and sacrifices

in demonstrating the feasibility of such cross-breeding; but it appears that Mr. Mossom M. Boyd, beginning in 1894, carried out and recorded the nearest approach to a scientifically adequate experiment. Lately, Mr. Boyd's stock has been obtained by the Canadian Government.

According to Mr. Boyd, in 102 successful impregnations of cows by Buffaloes, there were 63 abortions and 39 births. Of the 39 births, 6 were males, only two of which survived over 24 hours, and the one that became adult proved sterile.

Mr. Boyd used several breeds of cattle, and he tentatively summed up the dominance, or recessiveness, of the respective characteristics in the first hybrids as follows:

Dominant: whole body color of Buffalo (usually); the white face of the Herefords; the polled head of the Angus; the hump of the Buffalo (modified); width of the hind quarters of the beef breeds; the width in front of the beef breeds; the hair or fur in length and quality (intermediate); the voice of the Buffalo. The hybrids do not become bare by shedding hair, as in the case of the Buffalo.

Of 10 hybrids examined, 9 had the 13 ribs of cattle and one 14, like the Buffalo (this one died early). The first hybrids are superior as beef animals, becoming very large and cutting large portions of the choicest meats.

As potent hybrid males are not born, further breeding of the hybrids begins by breeding back to either Buffalo or cattle males. There is considerable infertility among the hybrid cows and they produce comparatively few potent males. However, after two or more crosses back either way, the matter of the sexes appears to even up.

However difficult the work and slow the progress, Buffalo characteristics are now scattered far and wide in the herds all over North America and even in Europe. It is entirely probable that successful breeds of the future will owe some of their success to these characteristics. That this has been the method, to a large extent, by which breeds of domesticated animals have been developed is altogether likely.

WILD WHITE (OR PARK) CATTLE

(For illustration, see Color Plate VI)

The ancestry of our improved breeds of cattle, such as one commonly sees in North America and Europe, has been attributed to several different sources. Important remains of two types that existed in prehistoric times have been found in considerable numbers in England and Scotland. One type, termed the Urus, or Giant Ox (*Bos taurus primigenius*), that stood about six feet high at the shoulders, existed in the early Stone Age, while a much smaller form, *Bos longifrons*, frequently referred to as the Celtic Ox, existed in the late Stone Age and was intimately associated with primitive man.

The remains of *Bos longifrons* have usually been found associated with human habitations, indicating domestication, even as late as the Roman occupation of Britain. Skulls of these cattle have been found in which were embedded stone celts or spearheads.

The nearest connecting link we have with these prehistoric forms are the Wild White, or Park, Cattle, as they are now coming to be known. Some authorities regard them as descendants of the Urus, while others consider them more directly related to *Bos longifrons*. The theory has also been advanced that they may be descended from cattle brought from southern Europe by the Romans and left to shift for themselves when the invaders were driven from England.

For centuries herds of Wild White Cattle have occupied certain parks and forest areas in England and southern Scotland. Hector Boece in 1527 wrote that in the great Caledonian wood there were bulls of the purest white, and that "they wer mair wild than ony uthir beistes."

There are at the present time five herds of Wild White Cattle descended from the original type that roamed in the primeval forests of Great Britain, as follows: At Chillingham Park, in Northumberland, and at Chartley Park, in Staffordshire; Cadzow Park, in Lanarkshire; in North Wales, at Vaynol Park, near Bangor, and at Lamphrey Court, in South Wales.

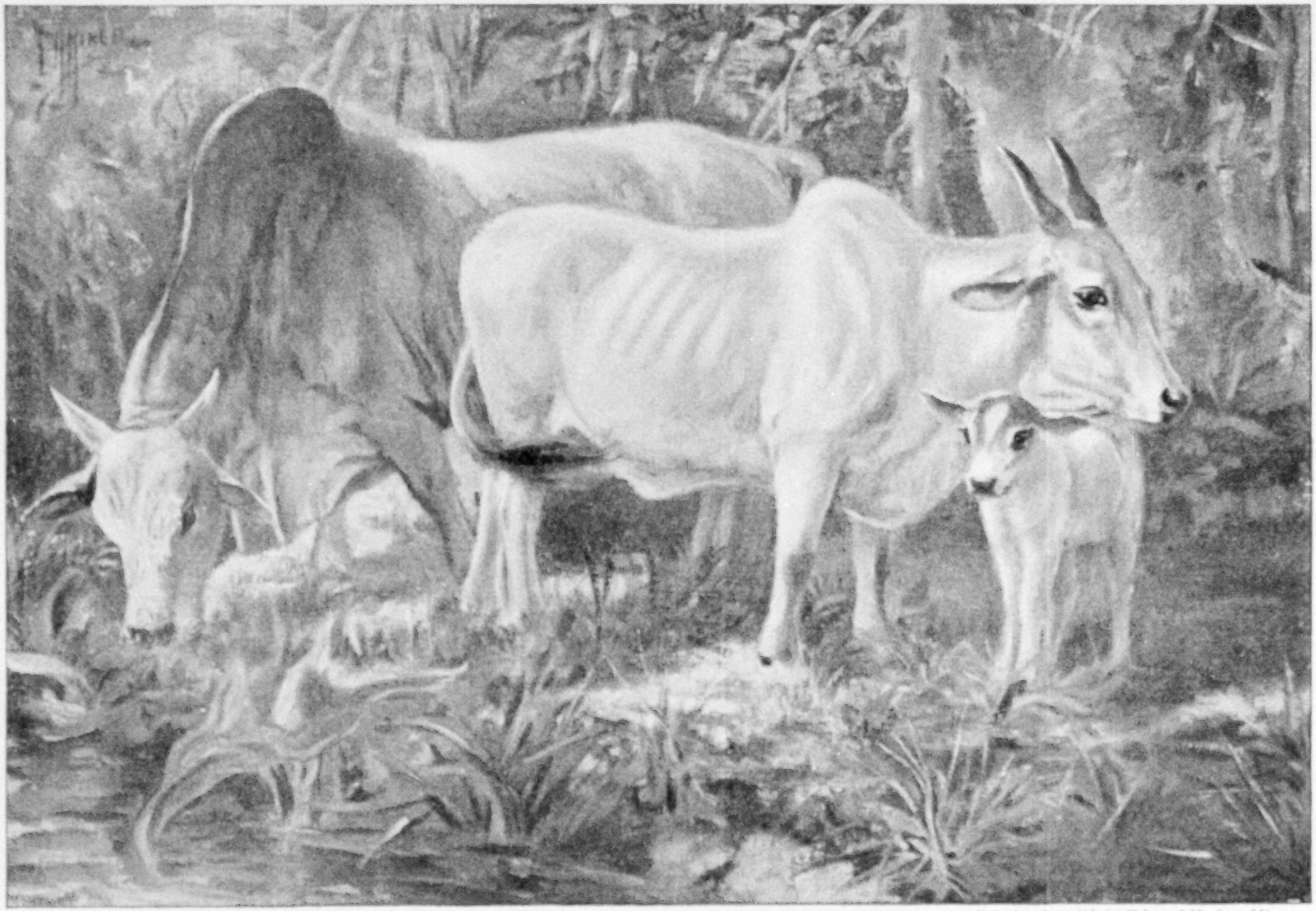
The Wild White Cattle are generally small, the dead weight of bulls at maturity being 500 to 600 pounds. While the general color of the hair is white, J. Storer, in his standard work on this breed, states that in all the herds the tips of the horns, the muzzle, the circle around the eyes, and the hoofs are black. The ears are either black or brownish red inside and more or less of the same color on the outside. Sometimes small dark spots occur about the neck and over the ankles.

In general form this is a beef type, but the quarters are thin and muscular. The coat is long and shaggy, and especially so over the top of the head and neck of the bull. Its disposition is distinctly wild where uncrossed with domestic cattle, and it quickly retires at the approach of man and seeks more inaccessible parts of its park home. While most of the known herds of these cattle have been horned, polled herds have also existed.

The most notable of the herds of Wild White Cattle is that of the Earl of Tankerville at Chillingham. It became famous through Sir Edwin Landseer, whose painting, "The Wild White Cattle of Chillingham," is one of his masterpieces.

This herd is kept in a park of about 1,100 acres, where for a long time the cattle have reproduced without the supervision of man. In 1919 the herd numbered 56 head. Some experimental work was begun here in 1875, crossing wild cows with purebred white Shorthorns, which resulted in cattle producing very superior beef. A line of crossing was continued whereby the fifth-generation cows descended from the Wild-Shorthorn cross were registered in Coates' Herd Book as Shorthorns.

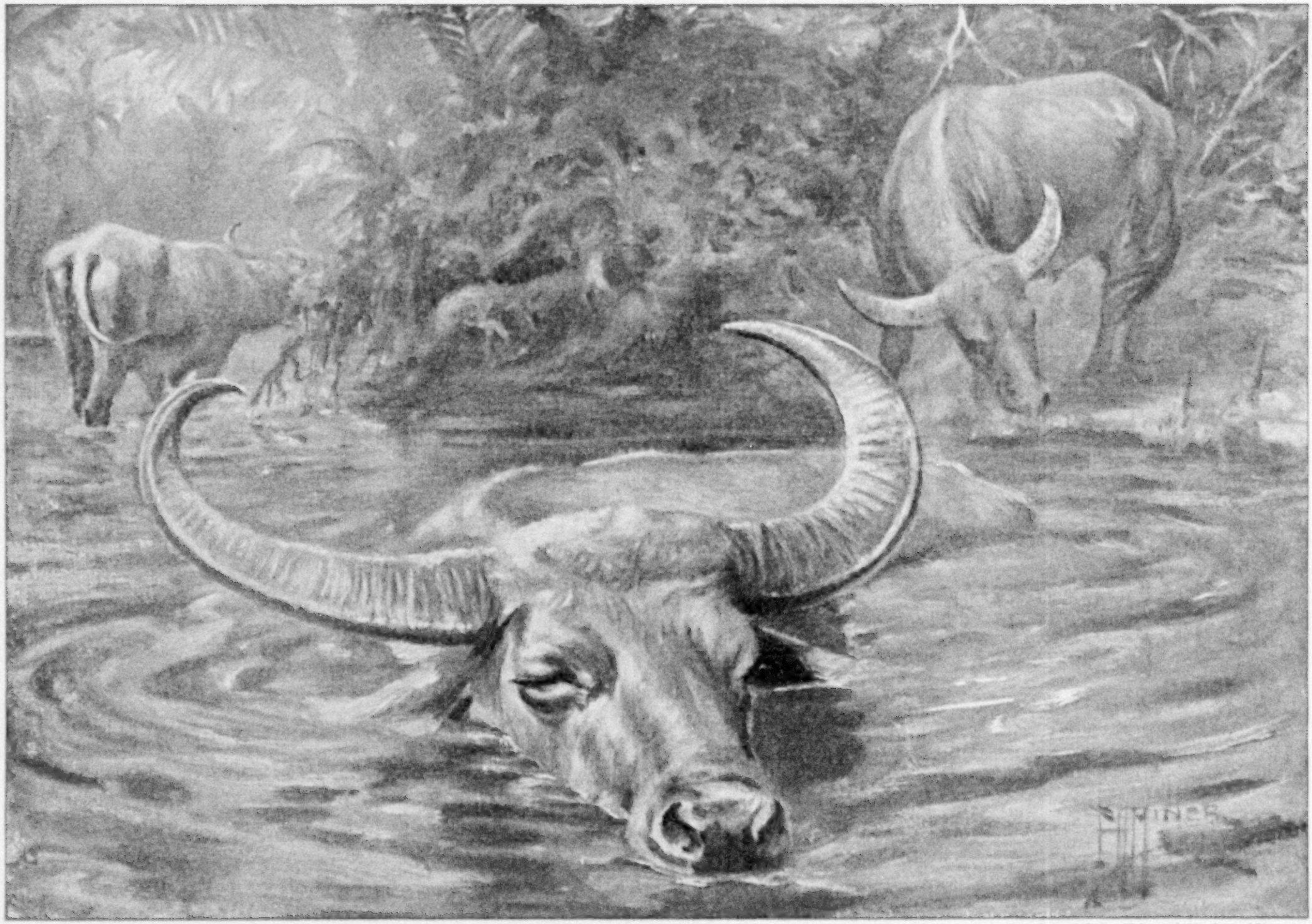
A Park Cattle Society was organized in England a few years ago to preserve existing herds and to promote their purity. In 1919 the society published the first volume of a Park Cattle Society Herd Book.



Copyright National Geographic Society

Painting from life by Edward Herbert Miner

BRAHMANS (ZEBUS) (*Bos indicus*), NATIVES OF INDIA



Copyright National Geographic Society

Painting from life by Edward Herbert Miner

WATER BUFFALO (*Bos bubalus*), A NATIVE OF INDIA

THE SHORTHORN

(For illustration, see Color Plate VII)

Standing at the head of all dual-purpose breeds, in point of distribution, is the Shorthorn, an English type originated in the counties of York and Durham, in the valley of the River Tees and contiguous territory; hence one of its early designations as the "Teeswater breed."

The Shorthorn may be solid red, red with white markings, white or roan; in fact, it is often referred to as "the red, white, and roan." Aside from its old-time competitor, the English Longhorn, which it long ago eclipsed in popularity, the Shorthorn is the only breed that throws the roan color, a fine intermingling of the individual red and white hairs.

The roan varies in shade from what is called red-roan to very light roans, verging on pure white. A roan coat, therefore, is as distinctive an index of the presence of Shorthorn blood as the white face is commonly indicative of a Hereford cross.

At one time in America the Shorthorn color most sought was the solid red. During that period white bulls were simply unsalable and the roans were discriminated against. This grew out of the fact that western ranchmen disliked the light colors for their particular purposes, and as the demand for Shorthorn bulls from the range was one of the mainstays of the trade, breeders naturally responded by maintaining red bulls in service in the pedigree herds from which the range country originally drew its supplies of breeding bulls.

This was a distinct disadvantage to the breed, as it limited the selection of sires at a time when recourse to all the best material within the breed was most required. Fortunately, in the old country the Scotch and English breeders were not subject to any such pressure and continued to utilize the roans and whites. At the present time the lighter colors have come back into their original popularity, and even the pure-white bulls are freely used in the most valuable collections, if possessed of outstanding merit.

In the early days of the introduction of the breed into the United States it was frequently called "Durham," after one of the two ancestral English counties, and it is to be regretted that this name did not meet with universal adoption. The appellation that finally obtained official sanction at home and abroad was originally given by way of differentiating the type sharply from the then widely distributed Longhorns of the Midland and western English shires.

The improved Shorthorn dates from the early years of the nineteenth century. A large but somewhat coarse race of cattle, possessing an extraordinary capacity to put on flesh under heavy feeding, and also noted for its milk-giving propensity, had for generations existed in Northumberland, Yorkshire, and the Tees River Valley. It was sometimes referred to as the "Holderness" breed, but that designation at length was supplanted by the general term "Teeswater stock," and subsequently by the name which the breed now bears.

At Darlington, Durham, Yarm, and other central points, market fairs, the forerunners of our modern shows, attracted all the progressive farmers and feeders of the countryside. The best specimens of the breed at that time were "generally wide-backed, well-framed cows, deep in their fore quarters, soft and mellow in their hair and 'handling,' and possessing, with average milking qualities, a remarkable disposition to fatten."

About three miles northeast of Darlington, in the County of Durham, overlooking a little stream that flows into the Tees at Croft, is the farm of Brampton, and about a mile beyond is Ketton. Upon these two farms the modern Shorthorn may be said to have had its origin.

Charles Colling had heard of Bakewell and his work, and in 1783 made a prolonged study at Dishley of the theory and practice of "close" breeding. In June of the following year he bought in Darlington market a cow, which he named Duchess, that gave rise to the family of that name, and which afterward became the subject of one of the wildest cattle speculations known in all the annals of English or American agriculture.

This primal Duchess was described as "a massive, short-legged animal of a beautiful yellow-red flecked color; her breast was near the ground and her back wide."

Robert Colling's selection of the bull called Hubback, distinguished for his fine finish and mellow-handling quality, marked the turning point from the old- to the new-type Shorthorn. It was with the blood of this bull that the Collings began their successful application of the Bakewell system, the issue of a doubly incestuous union being the bull Comet (155), the pride of his time, and the first Shorthorn to sell for $5,000.

The importation of this blood to America began in 1783, some years prior to the Colling improvement, at which date Messrs. Goff & Miller brought out specimens of the old Teeswater type to Virginia, the descendants of which, under the name of the "Patton stock," taken into Kentucky around 1800, laid the foundation of the Midwest cattle-feeding industry.

Other importations, as detailed elsewhere in this text, followed into New York, New England, and Kentucky, but it was not until after the full measure of the improvement made in England by the contemporaries and successors of the Collings had been realized that the breed obtained that widespread popularity in America that set in with the notable importations made between 1820 and 1860.

The leading spirits in Yorkshire in the making of the modern Shorthorn were Thomas Bates and the Booths, the former relying largely upon the blood of the Duchess tribe, derived from the cow of that name already mentioned.

Mr. Bates is generally conceded to have been one of the greatest cattle breeders of his own or any time. He sought refinement of conformation and milking capacity, combined with fleshing tendencies, and resorted to inbreeding to accomplish his purposes. So successful was he that for years after the dispersion of his herd, in 1850, cattle of "Bates" breeding were in demand on both sides of the Atlantic at ex-

traordinary prices. The culmination of a contest between English and American breeders was reached at the sale of the celebrated New York Mills herd at Utica, New York, in 1873, where a top price of $40,600 was offered for a single cow of the Duchess tribe.

The Booths, on the other hand, stressed the beef-making tendencies rather than dairy capacity, and were equally successful in that direction, their cattle being distinguished for shortness of leg and exceptional wealth of flesh. The achievements of these and other leading English breeders of their time were so phenomenal that the name and fame of the Shorthorn breed spread rapidly throughout the entire English-speaking world. In fact, up to around 1870, no other modern breed of cattle had any wide dissemination in the United States.

In the late seventies and early eighties the expansion of the beef-making business in the West turned the efforts of Shorthorn breeders toward a purely beef type, which resulted in a general recourse to the blood of cattle of a low-legged, deep-fleshed type that had been developed in Scotland.

In Aberdeenshire two brothers, Anthony and Amos Cruickshank, practically did for the Shorthorn at this period what the Colling brothers had accomplished in their day. Farming in a district not endowed by Nature with such favorable conditions in respect to grass, soil, and climate as those obtaining in the ancestral home of the breed, these canny Scots, disregarding more or less the dairy side of the business, set out to evolve a type that would be well adapted to making beef rapidly and economically from turnips, straw, and such grazing as the stony North Country afforded.

The story of how Amos Cruickshank slowly but surely accomplished this purpose has few parallels in this field. After years of careful selections from various English and early Scottish herds, there was finally produced at his farm of Sittyton a bull called Champion of England, representing so closely the ideal sought that for a long period of years none but his sons and grandsons were used for stock purposes.

Again the Bakewell system of establishing and "fixing" a type proved its potency, so that before 1880 this Aberdeenshire herd stood out as not only one of the largest, but one of the greatest collections of cattle of an easy-keeping, quick-maturing, dependable type in the bovine kingdom. It was already the fountainhead from which other North British breeders were drawing their herd bulls, and its character had been impressed very generally in Aberdeen and adjacent counties, where Shorthorns were kept in keen competition with the Aberdeen-Angus polls.

It is to this fortuitous circumstance that the breed owed its rejuvenation in America after the advent in the West of the other beef-making British races. Scotch-Canadians had already been drawing upon Aberdeenshire for breeding stock prior to the advent of the Hereford and the "doddies" in the Corn Belt States, and enterprising Middle West Shorthorn breeders, recognizing the inability of the cattle they had allowed to lose their old-time practical value for breeding purposes to meet the changing condition, were quick to see the opportunity of opposing the rival breeds by recourse to animals of Cruickshank and kindred production.

This revolution in American Shorthorn breeding occurred during the eighties. Great numbers of the Scotch cattle have since been transferred to this side of the Atlantic, and at the present time a large majority of the champions at all leading shows where beef form is the test of excellence are of this blood.

In recent years there has been a widespread movement toward the rehabilitation of the breed on this side of the water along strictly dual-purpose lines. The place of the beef type in the affections of Corn Belt feeders is, apparently, secure; but toward the East and throughout large areas in other sections of the country, where neither feeding for the beef market nor supplying urban centers with dairy products as a specialty is generally practiced, a great development in dual-purpose Shorthorn production is going on. Those who are interested in this are working with selected material of domestic production, reinforced by importations from English herds.

In various parts of England there are choice collections of cattle still showing the time-honored Shorthorn beef-and-milk combination. Cumberland and Westmorland are particularly famous for their big, broad-backed, deep-bodied cows swinging fine udders. It is inevitable that this movement in America will expand, to the manifest advantage of the country.

A number of extraordinary milk and butterfat records, comparing favorably with the best results from strictly dairy-bred cattle, have been made by registered Shorthorn cows in the United States, the highest being that of Dairymaid, who produced 19,666.5 pounds of milk in twelve months, carrying 669.45 pounds of fat. The records of 2,589 tests officially recorded show an average milk production of 8,444.98 pounds, with an average fat yield of 332.96 pounds.

A world's record for combined milk and butterfat produced in twelve months is held at the present time by the cow Melba 15th of Darbalara, recently reported from New South Wales, Australia, to have produced 32,522 pounds of milk and 1,614 pounds of butterfat.

The American Shorthorn Breeders' Association reports that 2,025,900 head of cattle of this breed had been registered in the Herd Book up to October, 1925. The census of 1920 reported a total of 478,760 head of purebreds in the various States.

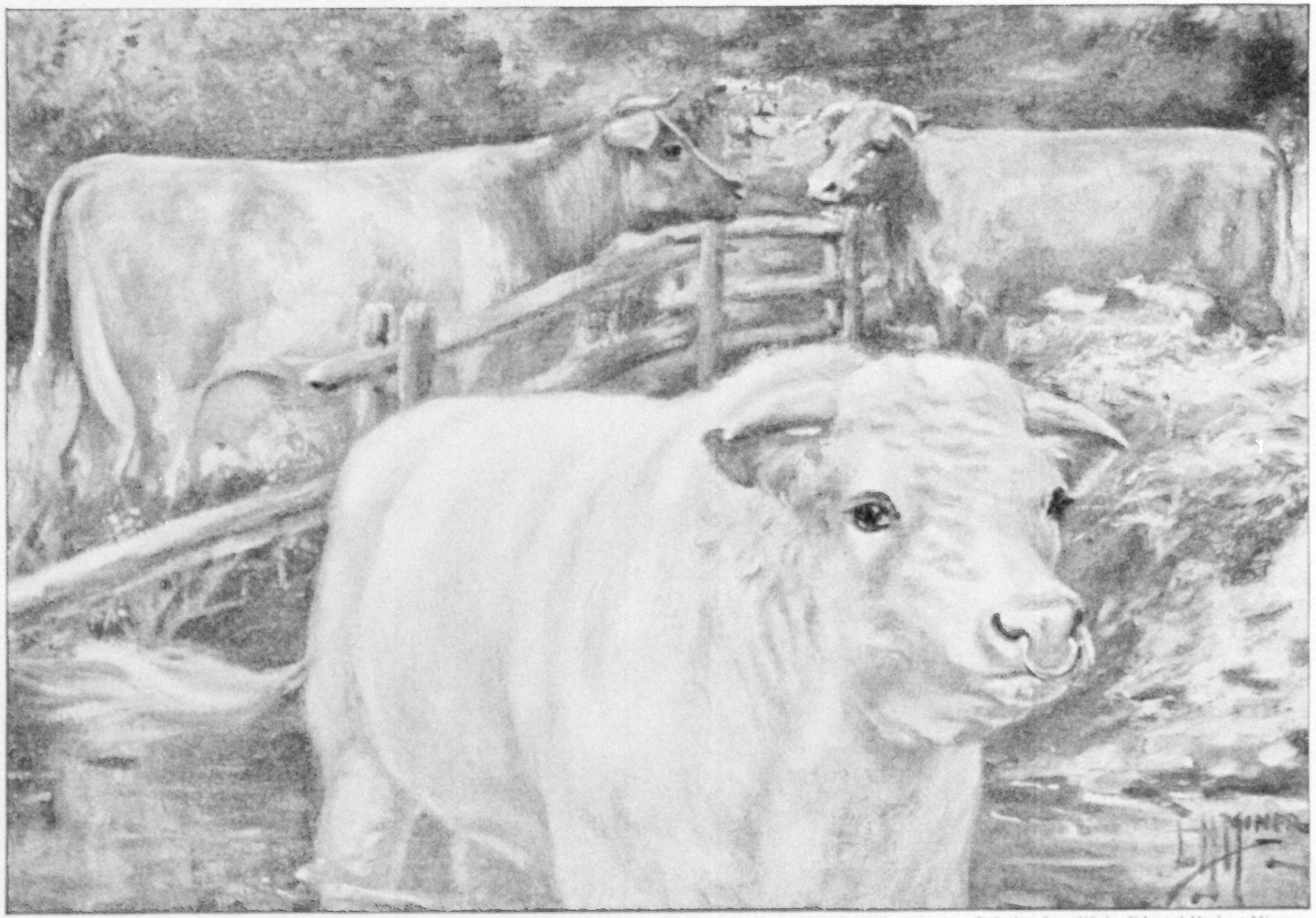
In Argentina the Shorthorn is a prime favorite in the operation of the large *estancias*, great numbers of the best and highest-priced animals of the breed in Great Britain having been bought for use in the extensive cattle-breeding operations conducted in the great grazing regions tributary to Buenos Aires. Shipments of American-bred cattle to Argentina have also been numerous in recent years

XUM

Copyright National Geographic Society

Painting by Edward Herbert Miner

THE WILD WHITE (OR PARK) CATTLE OF GREAT BRITAIN, SUPPOSEDLY OF *Bos urus* ORIGIN;
TO THE LEFT, CHILLINGHAM BULL; RIGHT, CADZOW COW AND CALF



Copyright National Geographic Society

Painting from life by Edward Herbert Miner

SHORTHORNS, AN IMPROVED BREED OF ENGLISH ORIGIN, VALUABLE BOTH AS DAIRY AND BEEF CATTLE

POLLED SHORTHORNS

Polled Shorthorns are just what the name implies—Shorthorns without horns. These cattle do not constitute a distinct breed, but are a strain of the Shorthorn breed, possessing all the color and type characteristics of Shorthorns except the horns. Their origin and development in the United States stand forth as important accomplishments in American cattle breeding.

The history of Polled Shorthorns is interesting, for it shows that back of all animal improvement there has been an economic reason. About the year 1880, when the feeding of cattle in feedlots of the Corn Belt assumed great proportions, it was found that cattle with horns could not easily accommodate themselves to limited space. Shorthorn cattle have always been popular with practical farmers, and it occurred to many farmers in various parts of the Corn Belt that crossing Shorthorns with native hornless cattle would produce the desired type. In 1888 the story of a small herd of naturally hornless, purebred, registered Shorthorns first appeared in *The Breeder's Gazette*. These "sports," or "mutants," were the property of the McNair Estate, near Minneapolis, Minnesota.

Five of these cattle, hornless Shorthorns, including the historic twins, Mollie Gwynne and Nellie Gwynne, were purchased by Captain W. S. Miller, of Ohio, and taken to the Buckeye State, along with their half-brother, King of Kine. These animals, and other natural Polled Shorthorns that were later found, constituted the foundation for our present-day Polled Shorthorns. With these animals it was possible to cross the polled and the horned purebreds, and to register all the progeny in the American Shorthorn Herd Book, where all Polled Shorthorns are now recorded. There was no loss here—the horned animals could be sold for seed stock as Shorthorns; the hornless ones could be sold for foundation stock among fanciers of the Polled Shorthorns.

The late J. H. Miller, of Peru and Mexico, Indiana, is credited with having been the outstanding improver of this strain of Shorthorn cattle. He introduced the best Scotch Shorthorn blood and developed Polled Shorthorns to the correct show-yard and market type. In breeding he worked improvement both through the female side and through the male line.

In 1896 Miller attended the dispersion sale of the famous Shorthorn cattle of the late Senator W. A. Harris, of Kansas, and purchased a carload of the best females in that herd. He took these cows back to Indiana and mated them with his polled bulls. This cross was followed up by the use of the best Shorthorn bulls he could find, including Sultan of Anoka, one of the best sons of Whitehall Sultan, credited with having done more to improve the type of the Polled Shorthorn than any other bull of the breed.

Many good milkers have been developed among the Polled Shorthorns, and many of the cows have qualified for the Record of Merit. In all, there have been more than 38,000 cows and nearly 30,000 bulls of the Polled Shorthorn strain registered. They are most numerous in the Corn Belt States of Iowa, Nebraska, Illinois, Indiana, Kansas, and Ohio, with South Dakota and Wisconsin ranking next in order.

BROWN SWISS

(For illustration, see Color Plate VIII)

The ancient Helvetians were a pastoral people, and Switzerland is to-day the home of three distinct types of cattle admirably adapted to their Alpine environment—the Schwyz (known in America as Brown Swiss), the Simmentals, and the Fribourg.

The cattle of the lake-dwellers of the Alps, of prehistoric times, receive frequent mention by scientists in connection with discussions of various wild bovine genera. The two mountain chains, the Alps and Jura, cross the country from northeast to southwest, and between Lake Geneva and Lake Constance is a beautiful region of hills and mountains of minor altitudes, the plateau called by the Swiss the Mittelland. These mountain pastures and meadowlands are ideal for cattle-breeding purposes and produce a rugged and yet productive race.

While maintained primarily for dairy purposes, the Swiss cattle are claimed to be a real dual-purpose type. They are heavier-boned than the Channel Island breeds and more inclined to take on flesh.

The original home of the Schwyz was the Canton of that name, but the type is now bred in all the neighboring cantons of the Alpine region. In color they range from dark brown and gray to lighter shades. The heavier specimens are found on the valley farms and the lighter weights in the high mountains. The average weight of matured cows of the heavier type is 1,200 to 1,300 pounds; that of bulls from 1,700 to 1,900 pounds.

Data assembled by the Schwyz Cattle Breeders' Association, based on performance in various herds, indicate milk production in their native land of about 10,000 pounds per year per cow, showing a fat content of about 4 per cent. In exceptional cases these yields are, of course, exceeded.

The Brown Swiss were first introduced into America by Henry M. Clark, of Belmont, Massachusetts, who imported a bull and seven heifers in 1869. It was not until the early eighties, however, that the type came into general notice. In 1882 Messrs. Nelson B. Scott, of Worcester, Massachusetts, and George W. Harris, of Wethersfield, Connecticut, made an importation of 10 head, which were greatly admired and disposed of to breeders in Connecticut. A second lot brought over by the same parties likewise were favorably received. This was followed by a third shipment that found a home in Illinois. In 1889 Enos M. Barton, of Chicago, imported 14 head, which became the nucleus of one of the best herds ever owned in the United States. McLaury Bros., of New York, made an important importation in 1904.

Brown Swiss cows are good and persistent milkers, possessing a large, square udder and well-placed teats, uncommonly free from malformations. The quality of their milk is indi-

cated by a full 4-per cent showing of butterfat. Switzerland is famous for its cheese, and the reputation of the breed in connection with that industry in America is of the best.

The Brown Swiss are of strong constitution, respond generously to liberal feeding, are exceedingly docile in disposition, and retain flesh well, even during periods of heavy lactation.

One of the profits of the dairyman is derived from the sale of veal calves. Those from Swiss cows are well-developed at birth, weighing from 80 to 100 pounds when dropped. They show the compact, blocky conformation so characteristic of the breed, and are, therefore, unexcelled as veal.

Among the high-production records of Brown Swiss cows in America may be cited the case of Hawthorn Dairy Maid, with the breed record at this date of 22,622.6 pounds of milk and 927.23 pounds of butterfat in one year.

Although the Register of Production of the breed in America was started only 10 years ago, 450 cows are already listed on the honor roll. Nearly 400 have qualified in the yearly test, the average of this large number of cows for one year being 11,773.4 pounds of milk and 471.63 pounds of fat. In the 10 months' test 58 cows have an average production of 9,640 pounds of milk and 381.45 pounds of fat. Ten high cows in the mature class of the yearly test have an average production of 800 pounds of butterfat.

All of the cows in the mature class, 156 in number, have an average production of 13,744 pounds of milk and 547.55 pounds of fat. Pretty Jane, the leading five-year-old, has a production of 18,042.5 pounds of milk and 801.42 pounds of fat for 365 days. All of the five-year-olds, 62 in number, that have qualified for the Register of Production have an average production of 519.7 pounds of fat for one year.

This breed finds much favor in central Europe, having long been utilized in Germany, in Austria, and in Hungary as well as in Italy. It is gaining ground in the United States and attracts increasing attention at our national dairy shows, the best specimens showing marked improvement in recent years.

The product of a mountain environment, the Brown Swiss should naturally respond well to the abundant forage of lower altitudes. It should also render a good account of itself in the mountain valleys of our own Western highlands, where dairy goods find an improving market as towns and cities increase in population.

There have been registered up to the present time in the American Herd Book a total of 13,395 bulls and 20,022 cows.

SIMMENTAL

For many centuries the Simmental, the valley of the Simmen River, in the Canton of Berne, Switzerland, with its splendid grazing, has been noted as the home of the type of cattle of that name which still find favor in their native land and in various parts of central Europe.

The Simmental is larger than the Schwyz (or Brown Swiss) breed, cows of the heavier type weighing from 1,400 to 1,600 pounds and matured bulls up to over 2,000 pounds. In color they are red and white, those in which the red predominates being preferred to the white with red markings. The red varies from a dark cherry to a yellowish shade.

The milk yield of the Simmental does not vary greatly from that of the Brown Swiss, ranging around 10,000 pounds per year per cow, with a fat content of close to 4 per cent.

In the old days the Simmental was extensively used for draft purposes in connection with agricultural operations. A Swiss writer refers to its great value for this purpose in the following language:

"The structure, the constitution and temperament of the cattle of the Simmental breed render them to a high degree apt for work. Strong bones, well-developed muscles of all the parts of the body, especially the back, the pelvis, the shoulders and of the limbs, a strong and elastic skin, a great facility in the movements of the articulations, a quick temperament, good nature, health and strength of resistance, intelligent eyes and docility are the special qualities of the Simmental cattle, and all this renders them apt for labor."

While this breed is virtually unknown in the United States, it has enjoyed much popularity, not only in Switzerland, but in south Germany—particularly in Baden, Württemberg, and Bavaria. They are also seen upon Austrian and Hungarian farms and in northern Italy. In these countries the Simmental bull has crossed to the satisfaction of farmers upon smaller, inferior stocks.

FRIBOURG

The Fribourg is a minor Swiss breed, taking its designation from the Canton of that name. In general character and size it is similar to the Simmental, but differs in color, being black and white. The Swiss prefer the black and white evenly distributed. Sometimes the animals show a white head and legs, with a black body, and again they come nearly all white or quite solidly black, but such coloring is tabu among breeders.

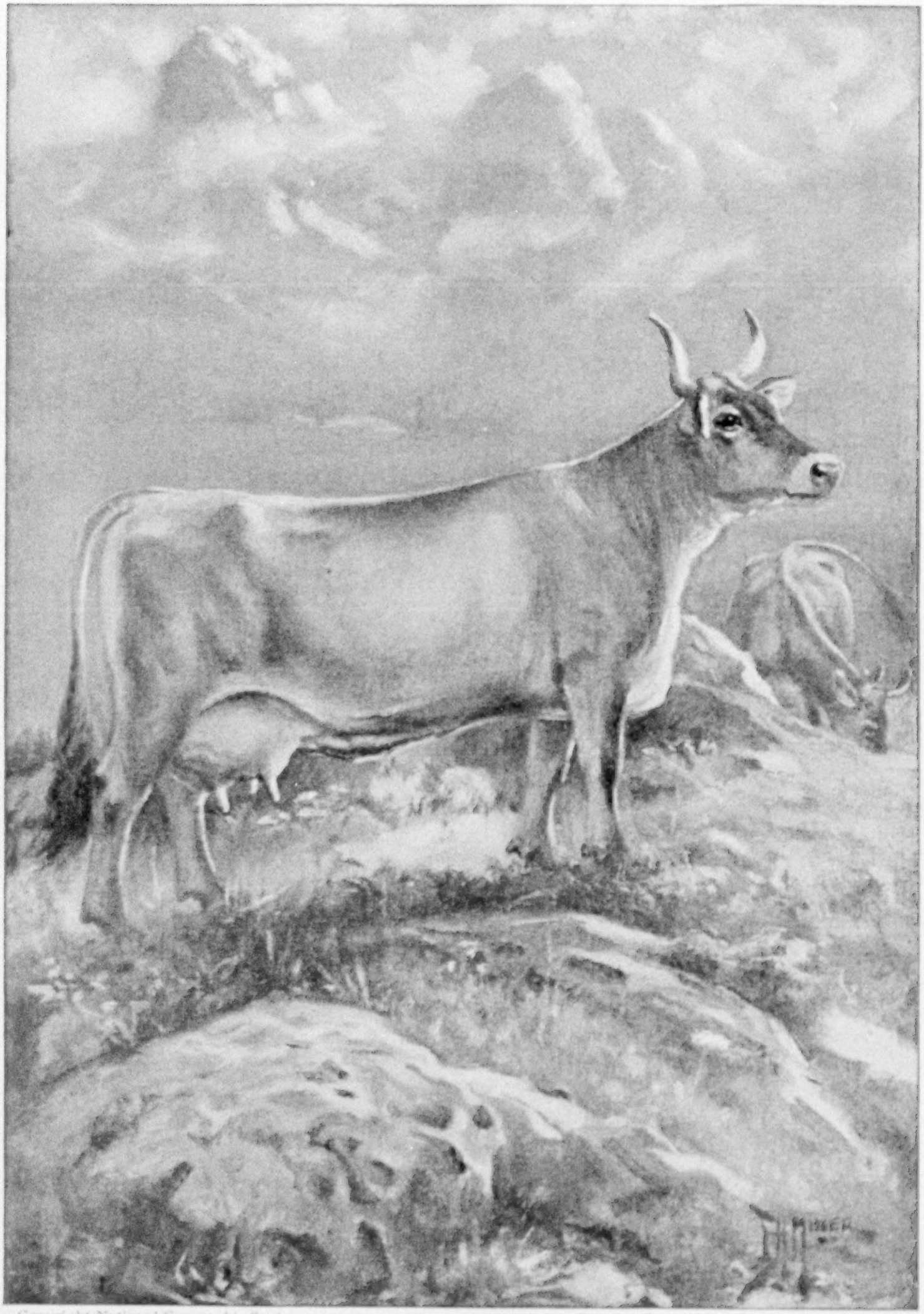
Animals of the Fribourg breed are seen in northern Germany and in parts of Russia; also in Italy and in Danubian territory.

NORMAN TYPES

The ancient Province of Normandy, in northwestern France, comprises nearly 7,000,000 acres, much of which is of superior fertility, where many cattle graze. While its cattle are generally known as Normans, the French classify them into two subraces or breeds—Cotentin and Augeronne. The former derives its name from the Cotentin district, a lowlying section in La Manche extending some distance back from the port of Cherbourg. In the Departments of La Manche and Calvados the breed is kept almost exclusively, but in recent years it has met with favor in other sections of France outside of its native Province.

The Cotentin is a large breed and combines in a marked degree both beef and milk production. The color is usually a combination of

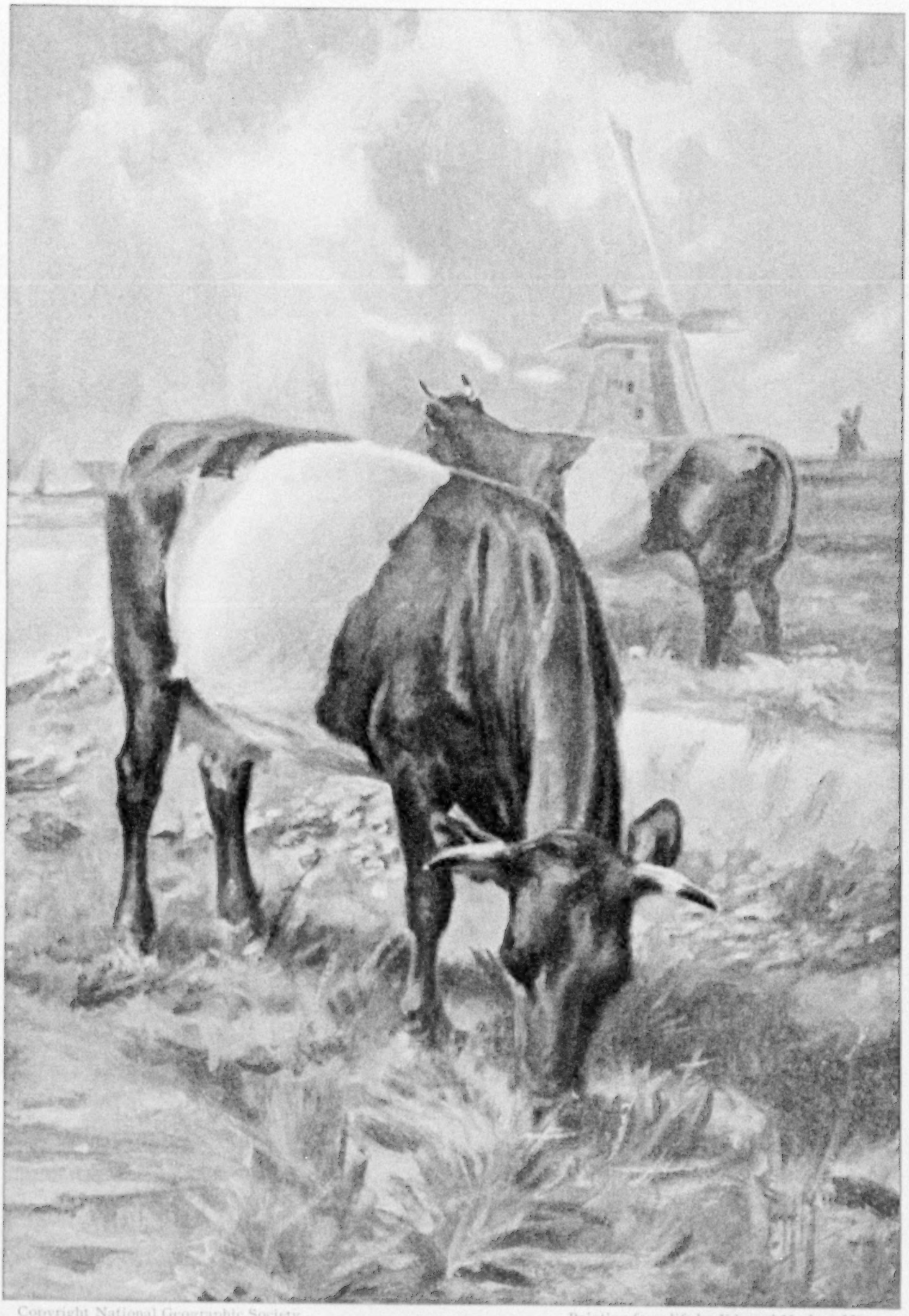
XUM



Copyright National Geographic Society

Painting from life by Edward Herbert Miner

BROWN SWISS COW, AN IMPROVED DAIRY TYPE OF ALPINE ORIGIN



Copyright National Geographic Society

Painting from life by Edward Herbert Miner

DUTCH BELTED COWS, AN IMPROVED DAIRY TYPE OF NETHERLANDS ORIGIN

yellow, red or black forming a brindle, or with white giving a spotted effect. Not infrequently the Cotentin possesses color markings similar to those of the Hereford, which has brought forth a suggestion that the former is the parent stock of the latter.

The breed has undergone much improvement, and to-day in France one will see fine examples of these cattle, neat and trim of head, wide and deep of body, thick through the heart, short of leg, with well-turned quarters. These improved Cotentins rather suggest the influence of Shorthorn blood in times past; in fact, many years ago the Shorthorn cross met with favor.

There is good reason to assume that the cattle on the Island of Guernsey are descended from those of Cotentin type in Normandy.

Remarkable reports are given as to the weight of these cattle. Richardson states that the fat ox used in the annual procession in Paris was mostly chosen from this breed, and sometimes exceeded 550 stone of 8 pounds, which would mean 4,400 pounds. Inasmuch as the French secure their weights through a process of measurement, or by estimate, we may feel sure that such figures are extravagant, yet truly indicating that the beast must be large.

A recent document from Normandy relative to the Cotentin states that at two and one-half years of age they produce approximately from 800 to 1,000 pounds of profitable meat—a reasonable statement. They fatten easily on pasture lands and compare favorably with other breeds destined for the meat market.

The traveler through Normandy with an eye for cattle is impressed with the evidence of large milk production to be seen among the cows in the pasture. The Cotentin is regarded as a remarkable milk producer, surpassing any other French breed. It has long been famous in that respect, and the Department of Calvados is noted for its immense production of dairy products.

In 1883 United States Consul John B. Glover, at Havre, France, wrote:

"Probably no other country in the world, of like size, produces more good butter than the Department of Calvados. Small villages in this region export to Paris large quantities of butter annually. The town of Isigny alone sends nearly 6,000,000 pounds every year. Gournay also sends 3,000,000 pounds."

So popular is the name of Isigny butter that, sad to say, much more butter is sold under that brand in Paris than comes from that favored spot.

An annual milk yield for the Cotentin of 6,000 pounds is regarded as a fair statement of average production, testing about 3.88 per cent fat. The pastures of Normandy are said to give a very attractive flavor to the milk.

The cattle of Normandy have been exported to many parts of the world. Considerable numbers have been sent to Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Uruguay. In 1888 Mr. Chester W. Chapin, of New York, imported for his farm at Chicopee, Massachusetts, a bull and two heifers. Mr. T. A. Havemeyer also made an importation in the early nineties for his farm at Mahwah, New Jersey, which he used for crossing with Jerseys. These importations bore no fruit of importance and the breed has passed from sight in this country.

BRITTANYS

Native cattle of the Province of Brittany, in the extreme western part of France, are known by the French as the Breton race. There are two types of this breed. One is small, lean, and of dairy type, the purest in ancestry and bred more especially in the Department of Morbihan. The other, of larger size, tending more to beef production, known also as the Bordelais race, is most common in the vicinity of Bordeaux.

Much of the Brittany country is of inferior fertility, and the cattle are given very little attention; hence they must be hardy to withstand the privations they undergo.

Brittany is the most distinctive cattle province of France. In Saint Herbot the French possess the one patron saint of cattle. Three days each year in May are devoted to his memory by the peasantry, who gather at the sixteenth-century chapel in the Department of Finistère, where his body rests.

During these days, we are told, all the work cattle in Cornouailles rest from labor. At one time they accompanied their masters, and if not taken on the pilgrimage they were reputed to find their way to the shrine alone. Now, by authority of the saint himself, their presence is no longer required at this celebration in his honor, provided a handful of hair from the tail of each animal is deposited upon the altar. The hair thus consecrated is said to fetch a goodly sum each year.

The origin of Brittany cattle dates into the misty past. The opinion has been expressed that they are descended from the small form of prehistoric ox known as *Bos longifrons*, having a similar ancestry to certain small cattle native to Norway, Sweden, and the British Isles.

Some French authorities have thought the cattle of Brittany were of Dutch ancestry of inferior size. It has also been suggested that the parent stock may have come from the "Indies." As in many similar cases, however, we have no evidence of importance regarding their origin.

Brittany cattle are usually black and white, the black predominating. There are also those of red and white, especially in Finistère. This is one of the smallest breeds, the true type being 36 to 40 inches high, and weighing from 300 to 400 pounds.

These cattle are noted among the French as producers of a relatively large amount of rich milk, an average annual yield of 1,600 liters (3,635 pounds), testing 5.7 per cent fat, according to Thierry. The Breton housewife is famous for her butter, and we are told by Richardson that the reputation of Brittany butter was first gained at the Château of La Prévalaye, about two miles from Rennes.

Efforts have been made to improve the cattle of Brittany. The Ayrshire and Jersey were introduced to increase the milk-producing quality, but without material benefit, and these crosses were discontinued. In 1877 Richardson

wrote that the Shorthorn was distinctly asserting itself against prejudice where the land is good enough, or farmed sufficiently well to give nourishing food. This is the case along the northern coast, and as far into the interior as good farming extends, but not on the southern coast.

In Finistère the Shorthorn is accepted more cordially, and it is not uncommon for a few small farmers to club together to buy a Shorthorn bull for general use. The mating of such extremes in size is somewhat illogical, but it has resulted in superior beef production in Brittany.

There are in this province of France cattle closely resembling the Jersey of a century or less ago, and the opinion prevails that the ancestral stock on the Island of Jersey came from animals in Brittany of this type.

NIVERNAIS

Among the hills of central France is the Department of Nièvre and the old Province of Bourbonnais. The upper waters of the Loire wind their tortuous way through this region, finding their source not far from the Rhône. Here, on the grass-covered hills, one sees the famous white cattle of France. Being native to Charolais, in Burgundy, the adjoining country to the east, these cattle are here known by this name. They have attained such fame, however, in the Nièvre that they are known as Nivernais-Charolais.

Charolais cattle are supposed to have been introduced into Nivernais about 1775 by a farmer from Brionnais. Here they did so well that the farmers generally engaged in breeding and feeding them.

The general form is that of the superior beef animal, with broad back, deep, capacious body, and short legs. The head is short, the forehead broad, the muzzle wide, the eyes prominent, and the comparatively small, white horns are gracefully curved forward and upward. The neck is short, as it should be, the bosom full, while the hind quarter shows the depth and thickness consistent with beef production.

A coat of pure-white hair and the reddish flesh color of skin on the muzzle and about the eyes suggest the white Shorthorn. In fact, white bulls of the latter breed were used many years ago in improving these cattle.

Richardson gives an interesting statement of a M. Colcombet, living in a district in the Bourbonnais where the Charolais breed prevailed, who developed a herd of white Shorthorns. He purchased a complete set of both the English (Coates') and French Shorthorn Herd Books and traced back from generation to generation the accidents of color in each family. With this knowledge he was able to select his stock with such certainty that he attained complete success. At the time of the show at Moulins in 1877 he had had 40 calves dropped, each perfectly white, without a single hair of red or roan. A Booth-bred bull, Silver Cloud, was an important factor in securing the results sought.

In the competitions at the Paris cattle shows the Nivernais-Charolais cattle have repeatedly won the highest awards. As producers of first-rate beef in France, they may be regarded as in a class by themselves among French breeds. They require more care and better feeding, however, than most breeds, and, when thus attended, give the expected returns. At two and a half years of age the well-fed animals weigh approximately 1,500 pounds. The better class of cows at maturity weigh from 1,400 to 1,600 pounds, and the bulls 2,000 pounds or more.

There are fine farms among the valleys of the Nivernais and Bourbonnais, and whether drawing a load of hay along the highway, hauling the plow in the field, or grazing on the hillsides, these beautiful white cattle lend a charm to the landscape. No wonder Rosa Bonheur found among the hills in the heart of France the right setting for her famous cattle picture, "Ploughing in the Nivernais," purchased by the French Government, and now in the Luxembourg Gallery.

In 1900 the Société Départementale d'Agriculture de la Nièvre established the Nivernais-Charolais Herd Book at Nevers, since which time many volumes have been published.

LIMOUSIN

Along the southern border of the central section of France is the old Province of Limousin. It is a country of hills and valleys, with mountains approaching 2,500 feet. Here and there are productive arable areas, but as a whole the country is not attractive agriculturally. A large proportion of its 2,000,000 acres is given up to grass and the raising of herds and flocks.

Here, we do not know for how long, the people have engaged in raising the Limousin breed of cattle. It is of medium size, yellow-red, with a lighter shade on the lower limbs, and with a body conformation suggestive of superior beef production.

In recent years the breed has been improved, and at the present time is regarded as one of the best in France. The many fine specimens seen in La Villette yards at Paris, as well as in the smaller markets of the south, bear testimony to that fact. The Limousin is celebrated for its docility, adaptability for draft labor, and early fattening. While not a recognized dairy-type breed, many of the cows yield a creditable amount of milk. M. Thierry, a French authority, says they produce annually 1,500 to 1,600 liters of milk, rich in casein, from which excellent cheese is made.

DUTCH BELTED

(For illustration, see Color Plate IX)

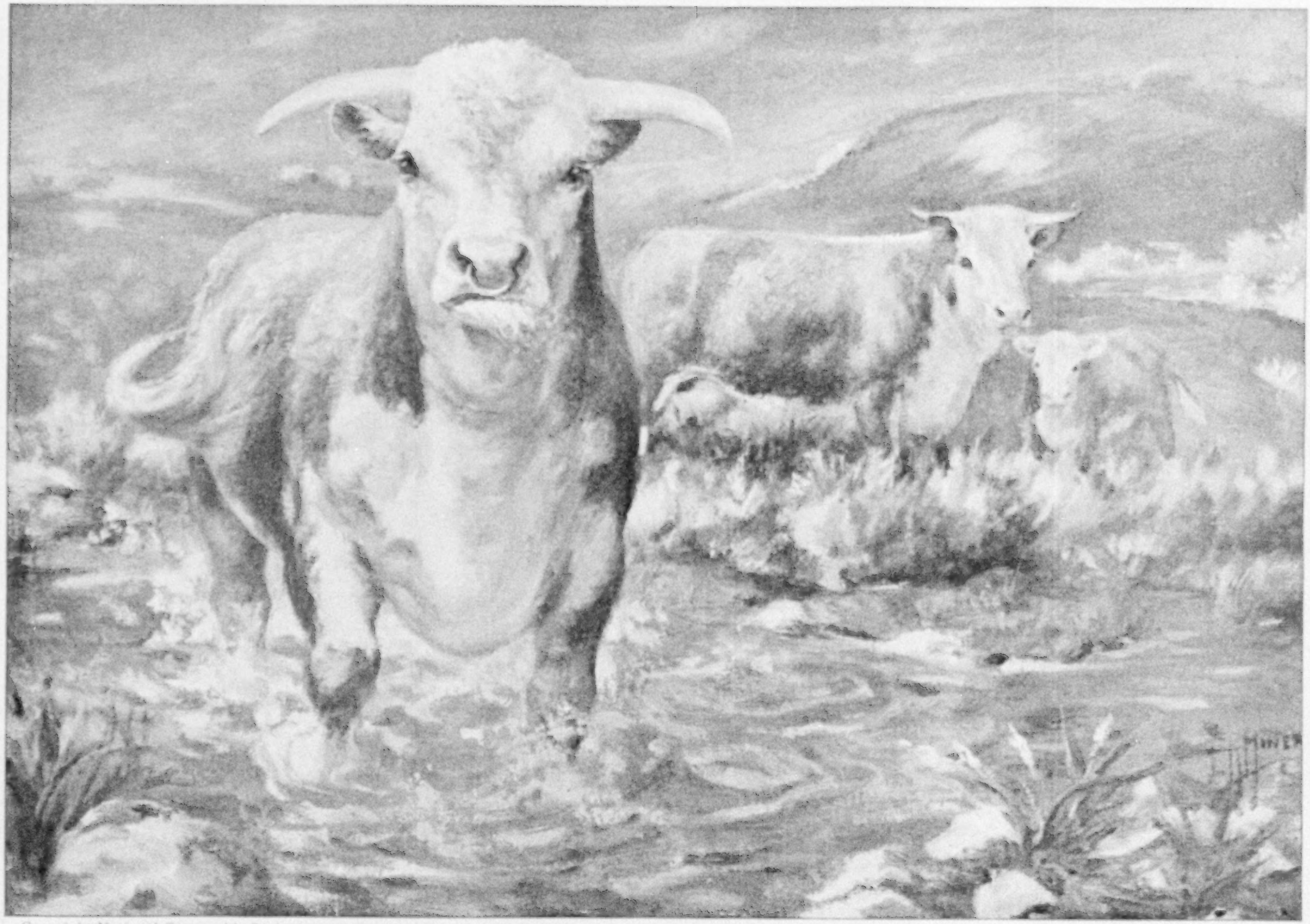
In the Provinces of Utrecht and North Holland are the Lakenfeld cattle, known in America as the Dutch Belted. These peculiarly marked cattle, of medium-size dairy type, black in color, except for a white belt about the body, originated in the hands of the Dutch nobility.

The first importation of Dutch Belted cattle into America was by United States Consul D. H. Haight in 1838. The first importation of importance, however, was made in 1840 by P. T. Barnum, the great showman, who obtained a few animals, for show purposes only, by

Copyright National Geographic Society

Painting from life by Edward Herbert Miner

HOLSTEIN-FRIESIANS, AN IMPROVED DAIRY TYPE OF NETHERLANDS ORIGIN



Copyright National Geographic Society

Painting from life by Edward Herbert Miner

HEREFORDS, AN IMPROVED BEEF BREED OF ENGLISH ORIGIN

agreeing that they were to be used principally for exhibition, as a feature of his circus. Mr. Barnum's herd was exhibited for several years as a rare and aristocratic breed, but subsequently was placed on a farm, thus becoming the progenitors of the Dutch Belted cattle in the United States.

In 1909 the Dutch Belted Cattle Association was incorporated under the laws of New Jersey. At that time most of the Dutch Belted cattle were owned in New Jersey and New York, but to-day representatives of the breed are to be found in almost every State in the Union.

This association has published 12 volumes of its herd books, containing pedigrees of all animals registered up to April 1, 1924. The number of registered females on record is approximately 3,300 and the males about 1,600.

In 1920 the Dutch Belted Cattle Association formed an Advance Registry Department, and highly creditable records have been made in official tests. To encourage this work, the association offered three silver cups to the owners of the three highest record cows. First prize went to Andrew Quackenboss, St. Cloud, Wisconsin, owner of Glenbeaulah Beauty, which completed an official record of 13,295.8 pounds of milk, with 531.19 pounds of butterfat; second prize to Dr. J. G. Du Puis, Lemon City, Florida, owner of Ferndell, whose record was 13,477.9 pounds of milk carrying 501.1 pounds of butterfat; third prize to J. A. Wilson, Brunswick, Maine, owner of Fritzi, with a record of 11,352.95 pounds of milk and 435.79 pounds of butterfat. Ferndell's record made her the champion dairy cow of Florida over all breeds.

In 1920 and 1922 a Florida herd, including the junior two-year-old class and seniors, on a 365-day A. R. O. official test, milked twice daily, completed an average of 9,998 pounds of milk, showing 427 pounds of butterfat. In this herd at the present time is a noted 12-year-old cow, Gem of Columbia, that has an official test of 17,285 pounds of milk showing 634 pounds of butterfat, on a strictly standard trial, running with 250 milking cows every day of her test period. This cow had previously completed a record of over 14,000 pounds before starting this last test, and has been milked continuously ever since she freshened the first time as a two-year-old heifer.

Princess B, in a Missouri cow-testing association, made a record of 15,998 pounds of milk and 712 pounds of butterfat.

HOLSTEIN-FRIESIAN

(For illustration, see Color Plate X)

The breeding of cattle has been an important industry with the Dutch for many centuries. According to Tacitus, in A. D. 28 Drusus, the father of Germanicus, imposed a tax of oxen hides upon the Friesians. It has been assumed by some writers that these early cattle were descended from the Urus, a primitive type of wild cattle inhabiting the forest lands of north central Europe.

Be that as it may, the people of the Netherlands have for centuries bred cattle of large size that are especially given to milk production. These cattle are not all alike, or of the same breed, a few provinces or districts being distinguished for herds possessing breed characters more or less different from those of their neighbors. Numerous old paintings of Dutch masters make apparent some of these differences.

In North Holland and in Friesland there has been developed a large breed of cattle, commonly black-and-white spotted, or pied, although red and white are occasionally seen. The males at maturity attain 2,000 pounds or more in weight and incline to be a trifle long and straight of face, with short, powerful, forward-curving horns, very muscular neck, and a large-framed, lean, muscular body. The cows are also characterized by a moderately long and straight face, small, incurving horns, slender neck, large body, and capacious udder.

These cattle of dairy type have been widely distributed over the more fertile lowlands of continental Europe, where they have been highly valued for their wonderful milk-producing qualities. The Friesians of Friesland, the Holland or Hollandais of other sections of the Netherlands, Belgium, France, Oldenburg, Holstein, and western Germany, the Jutland of Denmark, the Fribourg of Switzerland, the Holstein-Friesian of America, or the British Friesian of England are all essentially the same in type, color, and in milk-producing characteristics.

The designation of Dutch has been applied to such cattle, very generally, all through Europe, for no other Continental type has met with such widespread favor. While in continental Europe they are noted for large milk yields, the published records are very modest in comparison with those coming from England, New Zealand, and the United States, many Holstein-Friesian cows in our country having exceeded an annual yield of 25,000 pounds of milk.

South African Friesians imported into England in recent years have sold at large prices, one lot of 28 bulls realizing an average of £1,383, and 55 cows and heifers averaging £1,171, one bull bringing 3,900 guineas and one cow 4,300 guineas.

While the American name for this large black-and-white dairy type of cattle is Holstein or Holstein-Friesian, it should be Friesian, the word Holstein being a misnomer, having been applied in error as to origin.

When the Dutch colonized New York, then known as New Netherlands, they brought Dutch cattle with them to the valleys of the Hudson and Mohawk; but when New Netherlands was ceded to the British Crown and British settlers came over with British cattle, the Dutch cattle seem to have disappeared.

The first record that we have of a special importation from Holland was that made in 1795 by the Holland Land Company, which had large holdings in New York. We find that William Jarvis, of Vermont, also imported a few of these cattle, and later Herman Le Roy, of New York, brought a few into the Genesee Valley; but none of these people kept records or tried to maintain the blood pure, and it was

soon lost through mixture with the common cattle of the country.

In the sixties Winthrop W. Chenery and William A. Russell, of Massachusetts, together with William H. Tilton, of Maine, and the Miller Brothers, of New York, made importations of Dutch cattle, and for the first time records were kept. In the seventies the Unadilla Valley Association was formed in New York for the importation of Dutch cattle, and it also kept records. The first of these groups united with those to whom they had sold cattle and formed the Holstein Breeders' Association of America, while the second group and their friends formed the Dutch Friesian Association.

The first Holstein Herd Book was issued in 1872, and nine volumes were issued under that name. The Dutch Friesian Association also issued a Herd Book, of which four volumes were in time published. The two associations united in 1885, under the name of Holstein-Friesian Association of America, and the cattle are now officially known as Holstein-Friesians.

Dutch cattle were introduced at an opportune time, as the dairy industry in America was beginning to expand and farmer-dairymen were in need of a breed which would make large returns in milk production. There was a strong demand from the very beginning for the Dutch cattle, and they have rapidly increased in number until they have spread all over the United States and Canada and are the most numerous breed in practically all leading dairy sections of the country.

The Holstein-Friesian Association has become the largest of all the breed associations, and, counting in the Holstein and Dutch Friesian registrations, to the close of 1923 had recorded 1,317,020 animals in its Herd Book, of which 427,003 were bulls and 890,019 were cows.

In productive capacity Holstein-Friesian cows astonished even their owners, and early in the history of the breed in this country great records were reported. These began at 16,000 pounds of milk a year and soon ran up to a production of above 30,000 pounds, made by the New York cow Pietertje 2d. In 1882 *The Breeder's Gazette* offered a cup for the largest American 30-day butter production, and this trophy was won by the Holstein-Friesian cow Mercedes, owned by T. B. Wales, then secretary of the Holstein-Friesian Association, which defeated that of the famous Jersey, Mary Ann of St. Lamberts, by a few pounds of butter.

In 1887 a dairy show was held in New York, at which prizes were offered for butter production, and the winner was the Holstein-Friesian cow Clothilde. At the same show Holstein-Friesian butter carried off the honors. The butter production developed by Mercedes and Clothilde centered attention on Holstein-Friesian capacity in both yield of milk and total butterfat.

The Holstein-Friesian Association was the first to establish an advanced registry system, now common to all the dairy breeds. Mr. Solomon Hoxie, secretary of the association, had in mind some system which would assure the improvement of a dairy breed through selection in breeding. This idea was the germ of advanced registration, and its beginnings are found in the Dutch Friesian Herd Book, whose system specified that any purebred cow might be recorded in the pedigree register, but only cows that had met certain requirements in milk production should be recorded in the main register.

When the two associations breeding Dutch cattle united, one part of the agreement was that the new association should establish an advanced registry system, and when this was done the Holstein secretary, Mr. T. B. Wales, became secretary of the joint association, while Mr. Hoxie became superintendent of advanced registration. Mr. Hoxie was superintendent for 20 years, retiring in 1905.

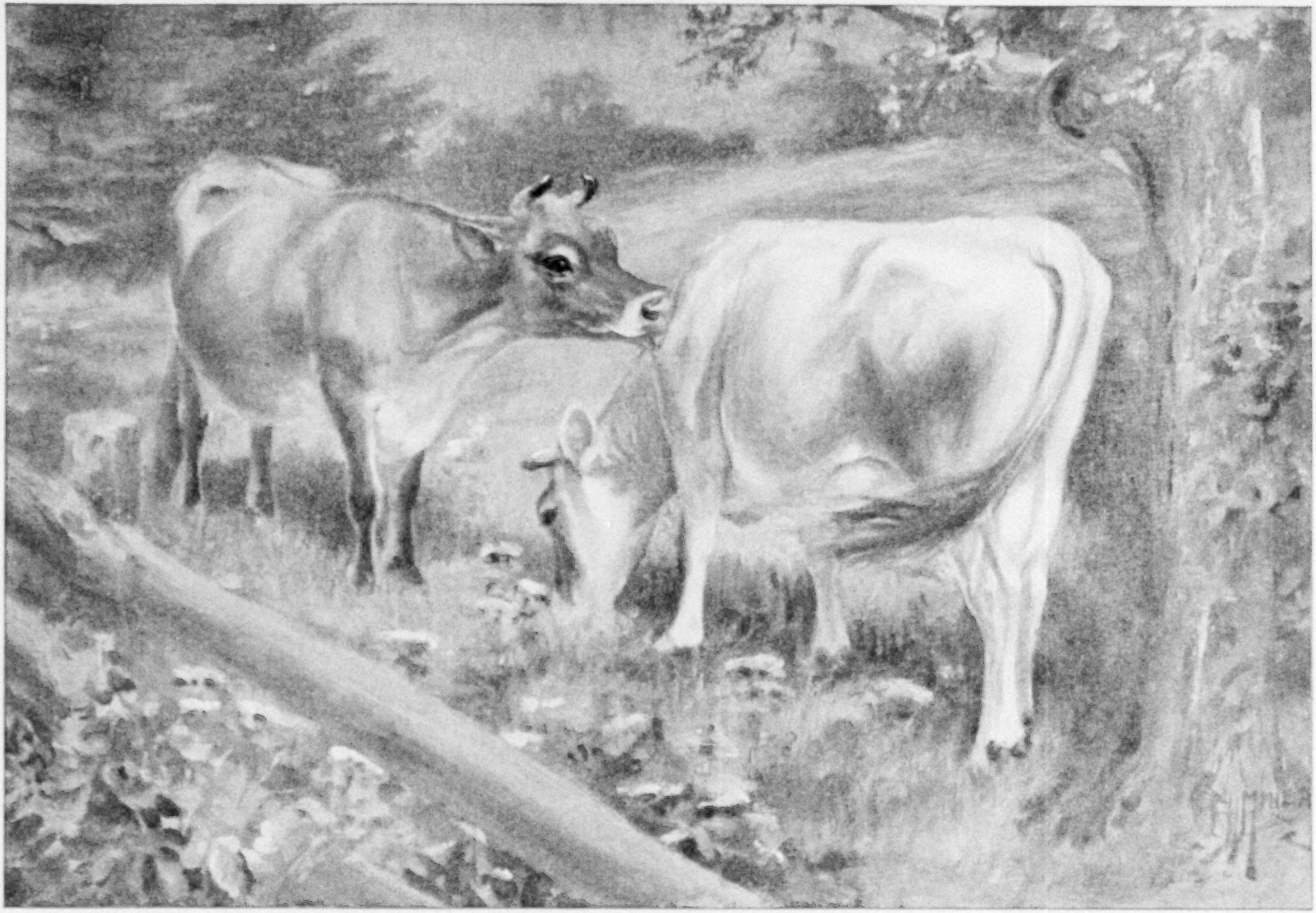
Advanced registration was first based on churned-butter production for a period of seven days, the results of each test being sworn to by all engaged in the making; and this plan was continued for ten years. The amount of churned butter required for a heifer freshening at just two years of age was 10 pounds, and the requirement was increased for each day of age up to five years, at which time the requirement was 15 pounds of churned butter.

The first four volumes of the Advanced Register contained the records made under this plan, which was not quite the success hoped for, because it did not have the full confidence of the public. In 1895 the method of testing was changed. State agricultural colleges began to supervise the conduct of the tests and made advanced registration the great success that it has since become. The Babcock test had been perfected, and instead of churned butter, the butterfat in the milk is quickly and accurately determined. This improved plan of testing was designated as official, the cows so tested being termed Advanced Registry Official, or A. R. O.

Some 110,000 different cows have been tested and admitted to advanced registration, of which nearly half have been tested more than once; so that more than 150,000 tests have been made. Bulls are admitted on records of daughters, any bull having four or more A. R. daughters being admitted to advanced registration himself. More than 7,000 such bulls have been admitted to date.

To show the improvement in short-time official testing, it may be mentioned that the seven-day average of 18 years ago showed an average production for cows and heifers tested of 408.1 pounds of milk containing 14.401 pounds of fat, while during the last testing year the average shown was 469.8 pounds of milk containing 17.538 pounds of fat. In long-period testing the average production for 1912 was 14,381.8 pounds of milk containing 494.87 pounds of fat in 342 days; in 1923 the average was 17,037.7 pounds of milk containing 574.85 pounds of fat in 337 days. It must be borne in mind that about half of the productions included in the breed averages are those of heifers with first or second calves.

Eighty-two Holstein-Friesian cows have produced above 1,000 pounds of fat in one year. The largest fat production is that of the cow De Kol Plus Segis Dixie, credited, under strictly official test, with 33,464.7 pounds of milk containing 1,349.31 pounds of fat. The largest



Copyright National Geographic Society

Painting from life by Edward Herbert Miner

JERSEY COWS, AN IMPROVED DAIRY TYPE OF CHANNEL ISLAND ORIGIN

GUERNSEY COWS, AN IMPROVED DAIRY TYPE OF CHANNEL ISLAND ORIGIN

Painting from life by Edward Herbert Miner

Copyright National Geographic Society

milk production was that shown by the cow Segis Pietertje Prospect, credited with 37,381.4 pounds of milk containing 1,158.95 pounds of fat. It was only a few years ago that the first Holstein-Friesian cow touched the 1,000-pound fat mark; and there are now 88 such records.

MINOR DUTCH TYPES

There are a number of other varieties of cattle in the Netherlands. In parts of North and South Holland, but more especially in the Province of Groningen, from which it gets its name, is a beef breed, usually black in color, except for more or less white in head, legs and tail, suggesting an Aberdeen-Angus-Hereford cross. In the Provinces of Drenthe and Overyssel may be found a very few cattle of the so-called Drenthe breed, which is similar in color and character to the Ayrshire of half a century ago. The Flemish or Zealand cattle have long been bred in Zealand, though of recent years in but a small way. This ancient type of the Zealand cattle is accurately shown in the famous picture of "The Bull," by Paul Potter, painted in the seventeenth century and now in the Gallery at The Hague.

DENMARK AND DAIRYING

The cattle industry in Denmark prior to the middle of the last century was of quite secondary importance. Up to that time the attention of the farmer had been devoted to general agriculture, with the small cereals as his main source of income. Realizing that the rewards for his industry were small because he was competing most unfavorably with other countries, he turned his attention to dairying.

The cattle of Denmark, upon which the dairy industry must rely for its supply of milk, were hardy and could subsist upon rather meager diet, but they had gone through no important period of improvement up to about 1850. There were then in Denmark several native so-called breeds which were generally regarded as rather productive milkers.

The more prosperous farmers of the country were the first to interest themselves in dairying, especially butter-making. The Danes realized that they had much to learn, so they established agricultural schools and experiment stations. Government experts visited the farmers and advised them, introducing better methods than those formerly used. After the milk separator was invented, a great impetus was given to dairying, and cooperative agriculture here began its most important development.* With this forward movement came the improvement of two breeds of cattle, to the exclusion of all other native stock.

The Red Danish breed is more especially found on the islands of Fünen and Zealand and the southern part of Jutland, on the mainland. It is regarded as a very old breed and, as its name indicates, is of a solid red color. Its improvement was begun by introducing superior milking stock from Angeln, in Schleswig, a territory contiguous to Denmark on the south.

The Angeln cattle were much better milkers than the Red Danish, but were not so rugged. The process of crossing continued more or less until about 40 years ago, since which time improvements have been obtained by careful selection. Many cattle breeders' associations were formed, and the breed became substantially improved in type, in uniformity of reproduction, and in milk yield. In 1883 United States Consul Ryder, at Copenhagen, reported that "there are large numbers of these cows which give an annual yield of 8,000 pounds of milk."

In recent years important official tests of production of milk and butter have been conducted, covering two-year periods. In 1919 some 700 cow-testing associations in Denmark included in their work 16,000 herds and more than 200,000 cows. During the 1913-15 tests about 300 cows averaged 9,341 pounds of milk and 398 pounds of butter. One herd averaged 10,551 pounds of milk, and we are told that a yield of 16,000 pounds of milk is not remarkable. The percentage of fat in the milk ranges from 3½ to 4, and this percentage is improving.

Red Danish cows at maturity weigh 900 to 1,200 pounds and, while of dairy type, when dry they fatten easily. This is now recognized as one of the more important dairy breeds of continental Europe.

Notwithstanding the merits of the breed, Red Danish cattle are as yet unknown in America; in fact, they are little known outside of their native home. On the valuable pastures of Fünen they are commonly tethered by chain and rope, and so are restricted in their grazing areas. Each day the cows are moved the length of the tether to fresh pasture.

There is a Red Danish Cattle Breeders' Association which promotes the purity of the breed and publishes a Herd Book, the first volume of which appeared in 1896.

Nothing seems to be known of the origin of the Jutland cattle on the mainland of the Danish peninsula. They are usually black and white, rarely gray and white. In appearance they suggest a close relationship with the black and white cattle of the Low Countries. Professor Rasmussen states that in the period from 1820 to 1850 efforts were made to improve the Jutland cattle by an infusion of new blood, and animals were imported from Tyrol, Switzerland, England, and Holstein. However, this crossing did not result in an improvement and was, therefore, discontinued.

Prior to the development of dairying in Denmark, these cattle were valued chiefly as producers of beef, but the increasing value of dairy products caused Jutland cattle breeders to pursue a careful policy of selection favoring the type of cow yielding milk abundantly; so, in the course of time, this breed has developed into what is essentially a dual-purpose type. In 1916-17 about 98,000 cows under test by 309 cow-testing associations gave an average yield of 6,719 pounds of milk testing 3.57 per cent fat. While this is regarded as a breed of medium size, Jutland cows range in weight from 1,000 to 1,600 pounds and aged bulls in good condition may weigh over 2,500 pounds.

* See, also, "Denmark and the Danes," by Maurice Francis Egan, Litt. D., in the NATIONAL GEOGRAPHIC MAGAZINE for August, 1922.

BELGIAN BREEDS

Prior to the World War the Belgians recognized the following six so-called breeds, or, as termed by them, races of cattle: Limon, Condroz, Herve, Ardennais, Campine, and Flamande. A study of these breeds, as exhibited at the biennial shows of Belgian breeds of cattle, held at Brussels, impresses the observer with the predominant influence of the large black and white cattle of the Netherlands and the red, white, and roan Shorthorn native across the Channel.

The World War brought about a serious change in the cattle situation in Belgium, for the invaders slaughtered much of the livestock or exported it to Germany, and breed conditions were left in a state of chaos. With the cessation of hostilities, large numbers of cattle were sent into Belgium to replenish the herds and primarily to provide milk for the children. This brought into the country a new seeding of Dutch and Shorthorn blood.

At the present time the Belgian Government recognizes four races of cattle—red, red and white, blue (or roan), and black and white. The red race, also known as Red Flemish, is very suggestive of the Shorthorn and is valued for beef and milk. It is best suited to extreme western Belgium. In the red and white race, there are two subraces, the Campine and Flemish Spotted. The Campine is bred along the Dutch border, on sandy or very light lands, and is more valued for milk than for beef production, the better grades of cows producing about 15,000 pounds of milk testing 4 per cent fat in 300 days.

The blue race is characterized by a coat of hair in which the black and white are mingled as in roan, but with the red shade lacking. In fact, within this race of Shorthorn type may be found animals that are entirely black or entirely white. These cattle are especially valued for beef and are best adapted to central Belgium, where the soil is most fertile. The black and white race is essentially the Friesian, or Hollandais, and is valued for dairy purposes, more especially cheese making.

SCANDINAVIAN RACES

The breeds of cattle of the more northerly sections of Europe, especially from 60 degrees north, have attracted very little attention. This is due to unfavorable climatic conditions and to a population rather sparsely distributed over mountainous or timbered regions generally unsuited to livestock husbandry.

The cattle of Norway and Sweden tend to be small, resembling in that respect those of Brittany, the Channel Islands, Shetlands, and the Kerries of Ireland. Weights of mature animals commonly range from 600 to 800 pounds, while the dairy or dual-purpose type meet with most favor, milk production being the first consideration. Red Polled and Ayrshire cattle have been introduced to a considerable extent from Great Britain and have done very well in the more southerly latitudes.

In Norway a number of breeds have been on record for several centuries. In the western and southwestern sections there are cattle with and without horns and of various colors, such as black, dun, gray, or red. Near the more southwestern sections the Vest-Agder cattle, red and polled, resemble the Red Polled of the more milky type.

The Telemark cattle, native to several districts of middle and southeastern Norway, of which Telemark is one, are commonly red of head and body, but with a strip of white along the back, from the horned head to the tail, and with the breast, belly, and legs more or less white. This is a mountain breed, deep of body and short of leg, the cows weighing from 700 to 800 pounds and producing approximately 5,000 pounds of milk a year.

In a more southeasterly section of Norway, in the upland valleys known as Gudbrandsdal and Österdal, is a gray or reddish-gray, horned breed, the cows of which yield about 4,000 pounds of 4 per cent milk. Two little-known breeds are found in the north-central section of Norway. Röros cattle, in the highlands south of Trondhjem, are polled and are sometimes nearly white, except for more or less red, gray, or black markings along the sides. Another breed, the red Tronder cattle, found in Trondelag, is horned and solid red. These two breeds are of distinctly dairy type and tend to be small of size.

There are four well-known breeds in Sweden—the Friesian, Ayrshire, Red and White Swedish, and White Polled, or Mountain. The Friesians were imported from the Netherlands a century ago and the Ayrshires from Scotland in 1847. These cattle are promoted by Swedish breed associations and are most abundant in the more fertile level sections of South Sweden.

The Red and White Swedish originated some 40 years ago, from crossing Shorthorns and Ayrshires on the native red cattle. This is a dairy type of good size, the better cows yielding nearly 10,000 pounds of milk a year.

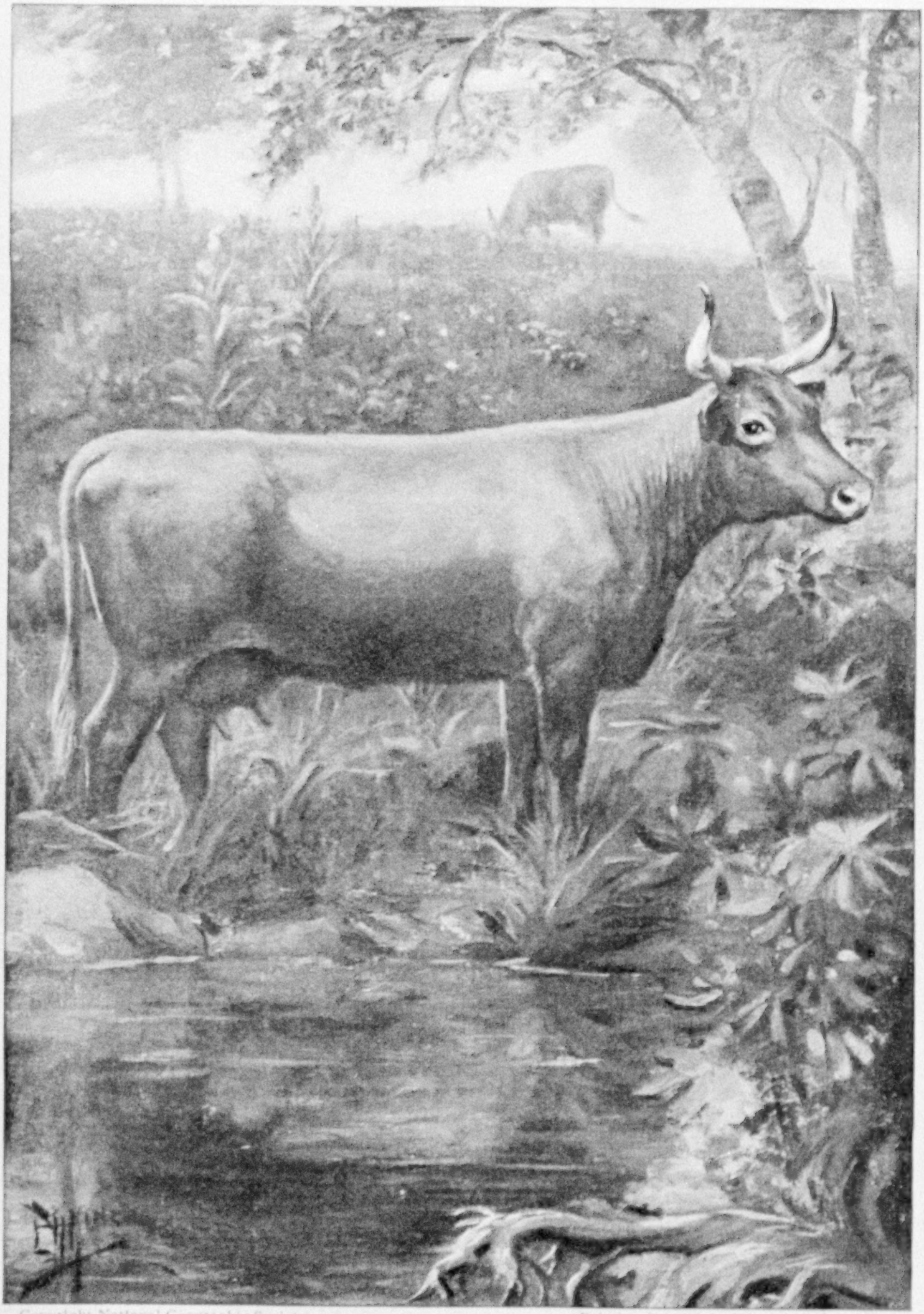
White Polled cattle are found in the highlands of North Sweden, and so are also known as "mountain cattle." They are generally white, perhaps slightly mottled with small black or brown spots, of dairy type, and weigh about 900 pounds.

SOUTHERN EUROPEAN STOCKS

A surprising number of breeds, or so-called breeds, of cattle are credited to the various European countries by livestock authorities. For example, Diffloth's "Races Bovines" describes more than 40 breeds more or less common in France.

While some of the more important British and Dutch breeds have been distributed over continental Europe, most of the native breeds are limited to restricted areas or districts and derive their names from the localities in which they originated. Many of these European breeds show no evidence of constructive breeding and have little to commend them to persons familiar with the ones more highly developed.

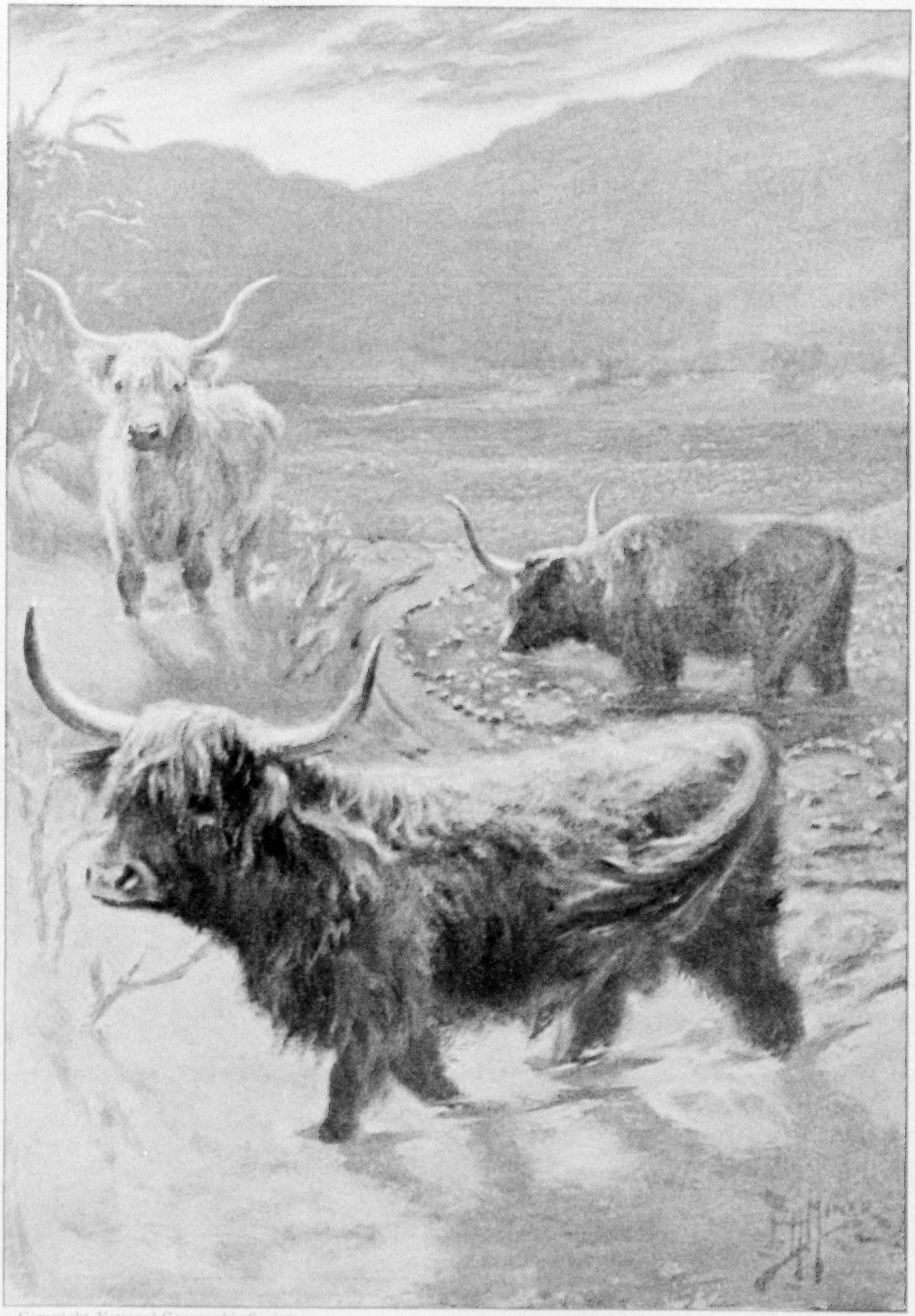
Cattle are used very generally for labor in continental Europe; therefore, over much of



Copyright National Geographic Society

Painting from life by Edward Herbert Miner

DEVON COW, AN IMPROVED BEEF AND DAIRY BREED OF ENGLISH ORIGIN



Copyright National Geographic Society

Painting from life by Edward Herbert Miner

WEST HIGHLANDERS, SMALL MOUNTAIN BEEF BREED OF SCOTTISH ORIGIN

France, Germany, Russia, and the southern European States, size, strength, and docility are regarded as valuable attributes.

There are certain characteristic features of the cattle of southern Europe. The forehead is short in proportion to the distance between eyes and end of nose. The neck is very rough and muscular, especially with the males, with a heavy edging of skin, known as the dewlap on its lower side. The horns are of medium size or large, according to the breed.

Extremely long, heavy horns are found on some of the cattle of Italy, Spain, and Hungary, a spread of five feet between the tips being occasionally seen on the cattle of those countries.

While the color varies according to the breed, it is more often solid than parti-colored. A light or silver gray or fawn, approaching white, is characteristic of a number of breeds, of which the Chianina of Tuscany, the Castilian of Spain, and the Campagna of Italy are good examples. There are also breeds of dark fawn, red or brown, with light shadings about the eyes, muzzle, along the backbone, and in some cases along the belly and inner side of the legs.

The White Back cattle of Poland present an interesting example of a very marked departure from solid color, with more or less white on head, back, belly, tail, and legs.

Lydekker states that fawn or chestnut was especially favored by the ancient Romans in their cattle, and it is this color which is most prevalent among the cattle of the Gallego and Navarra districts of Spain, while certain white cattle may be the descendants of the Roman sacrificial breed.

The skin of the southern European cattle tends to be heavy to the touch and is shorter and thinner of coat than prevails on the cattle of more northern latitudes. Not only the skin, but the bone as well, tend to be heavy, with the joints expressive of coarseness.

Milk production is not well developed, as a rule, among the breeds of continental Europe, except in the Netherlands, Denmark, and Switzerland. Germany has been an extensive importer of Dutch cattle, and their influence has been beneficial in improved milk production.

Temperamentally, the cattle of southern Europe, notably along the Mediterranean shores, are extremely quiet and especially adapted to draft purposes, for which they are so much valued. They are not all so, however, for in Spain, where bullfights are a popular amusement, a specialty is made of breeding fighting bulls.

THE HEREFORD

(For illustration, see Color Plate XI)

The established trade-mark of the Hereford is a white face. Wherever you see that, accompanied by a red body with a few white markings on legs, crest, or lower line, you may be sure you are looking at a specimen of one of the most efficient bovine machines yet produced for the conversion of grass into beef, especially under climatic conditions that are not so dependably met by other breeds.

The Hereford is the product of generations of intelligent work on the part of the tenant farmers and landed proprietors of the fertile valleys of the Severn and the Wye, in the west of England. While it has not extended its dominion particularly beyond the confines of Herefordshire in the British Isles, it has proved the one great leader of the bovine kingdom as the successor of the American Bison on the vast grazing grounds of the western United States, and as such it divides honors fairly with the Shorthorn and the Aberdeen-Angus as a factor in the total beef supply of this continent.

In situations where feed is abundant, as in the corn and blue-grass areas, other breeds compete upon even terms; but on the plains and high plateaus of the arid Rocky Mountain regions of the West on the open range, the Hereford reigned practically supreme, because of proved ability to cope with the conditions surrounding cattle-raising in a land where beasts often had to "rustle" actively for the bare necessities of bovine life.

The Shorthorn is used satisfactorily in some cases as a "cross" designed to maintain size, but Western cowmen, as a whole, testify that they can no more get far away from the Hereford hardiness upon extensive pastures than Western flock-owners can depart from the sturdy, close-wooled merino sheep in favor of the English mutton types.

This being the case, the Hereford must be set down as one of the greatest assets of the American cattle trade, in so far as beef-making is concerned. Other breeds make wonderful developments in the feedlots of the Central valleys and the East, but in the range country proper, all the way from the Rio Grande to the grassy reaches of the Canadian Northwest, the Hereford is still the favorite type.

In the remote past we find kinship between the Hereford, the Devon, and the Sussex—the red color, as is commonly assumed, dominant in all three breeds being derived probably from a French or Norman source. Just how the white face and markings came to differentiate the Herefords from their relatives of adjacent shires is not definitely known.

Herefordshire is noted for its luxuriant grasses, and as far back as agricultural records exist it is clear that the farmers of that district put beef production and value for draft purposes in their cattle stocks above dairy propensity. They wanted weight and strength at the yoke; and, as their lands were not so rugged as those in Devonshire, they could utilize a larger beast for the grazing.

And so it came to pass in the course of time that the heavy flesh-bearing red-with-white-face breed, which has in modern days proved such a blessing to Western America, was established.

The first great improver was Benjamin Tomkins, a county magnate with the Briton's inborn love for good domestic animals. He was followed by John Price, who made careful selections from the best of the Tomkins blood and inbred the blood, so that it made deep impress wherever used by his contemporaries

and successors. He sought beef, with little regard for milk.

Then came the Hewers, the Jeffries, Knight of Downton Castle, the Greens, the Tudges, Benjamin Rogers, John Price of Court House, Lord Berwick, Taylor, the Edwards, Stephen Robinson, Aaron Rogers, Thomas Carwardine, the Turners, and a galaxy of the ablest men who ever gave time, money, and talent to livestock improvement.

The story of the Hereford in America may be divided into two periods: the first and least important, their early introduction into the Central and Eastern States, and, secondly, their advent upon the Western ranges. It has been generally believed that Messrs. Goff & Miller, who made the initial importation of Teeswater Shorthorns into Virginia in 1786, brought in also at least one bull of Hereford blood. It is known that the importation included a few Longhorns.

While the Shorthorn blood predominated in the first of these Virginia cattle taken into Kentucky, a celebrated stock bull in the early days of cattle breeding in the blue grass country, belonging to the so-called Patton (Goff & Miller) stock, known as Mars, was described as "a deep red with a white face," and there can be little doubt that he was of Herefordshire origin, and his blood was widely used in laying the foundations of Kentucky and Ohio cattle-breeding operations.

In 1825 Hereford blood came into New England, Admiral Coffin, of the English Navy (born in Boston), presenting a pair to the Massachusetts Society for the Promotion of Agriculture. This bull lived to the age of 19 years and left a valuable progeny, of which Mr. Sanford Howard, who was interested in cattle breeding in Maine and Massachusetts, writes:

"I saw many of the bull's progeny in the vicinity where he was first kept, and owned some of them. They made prodigiously powerful and active draft cattle; there was a majesty in their gait and an elasticity and quickness of movement which I never saw equaled and which, together with their beautiful mahogany color and strong constitutions, made them decided favorites with the Yankee teamsters."

The popularity of the get of this bull led to an important importation by Mr. Howard, for account of the Messrs. Vaughan, into the State of Maine in 1830. In the hands of Messrs. Burleigh & Bodwell the descendants of this importation acquired great reputation throughout New England.

In 1840 Hon. Erastus Corning, of New York, imported 22 head from Herefordshire. These fell into the hands of William Henry Sotham, who undertook to popularize the breed in the West, but with no particular success. He sold a good lot, however, to Hon. John Merryman, of Cockeysville, Maryland, who later became one of the best-known American breeders of his time.

In 1846 Phineas Pendleton, a sea captain of Searsport, Maine, brought over a pair of Hereford calves that constituted the foundation of the famous Underwood herds in Maine. A few subsequent importations were made into Massachusetts, and in 1852 two Herefordshire farmers, emigrating to northern Ohio, brought the first of the blood direct from the old country into that State. They made another importation in 1860, and during that same year Hon. Frederick William Stone, a Warwickshire man who had immigrated to Ontario, made an importation into Canada. Descendants of these Ohio and Canadian cattle subsequently supplied the material for the first great experiments with the blood of the Hereford in the West.

Up to 1870 it may be said that, outside of New England, where oxen were in regular use at the yoke, the Hereford had not made any particular headway against the Shorthorn, which by that date was a prime favorite in American cattle-breeding operations all the way from Massachusetts Bay to the Missouri River. But a great day for the Hereford was dawning.

In southern Texas, soon after the close of the Civil War, Captain Richard King and his friend, Captain Mifflin Kennedy, were unwittingly preparing the way for the great Western cattle-grazing industry.

These men, beginning with Spanish Longhorns, assembled large herds near the Mexican Gulf coast, obtaining control of vast tracts of grass for that purpose. From this nucleus cattle ranching extended north and west until by the middle seventies it had grown to large proportions.

The Kentucky and Missouri Shorthorn herds had been drawn upon for improving the Longhorns, so that when the first Herefords were taken to Colorado and northern Texas for experimental purposes the foundation had already been provided.

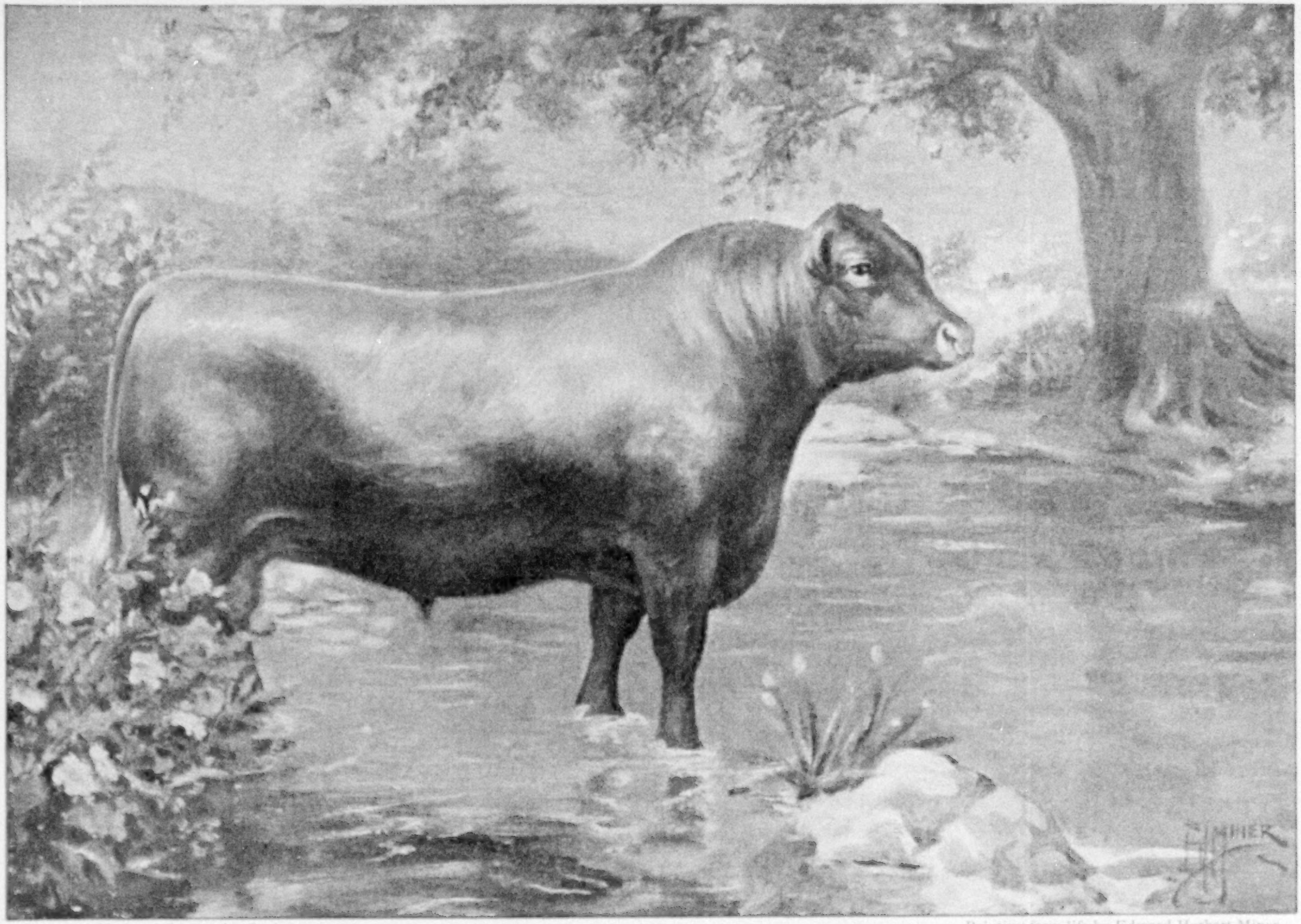
As early as 1876 favorable reports as to the results of the use of white-faced bulls on the range began to come in. T. L. Miller, a Chicago business man owning a farm at Beecher, Illinois, had already espoused the Hereford cause and, sensing the possibilities involved in the Western trade, began an enthusiastic campaign to promote the adoption of Hereford bulls throughout the entire range country.

The hard winter of 1880-81 clinched the claims of the white-faces as the one breed best capable of facing grief, and from that day to this the ascendancy of the breed on the Western ranges has been maintained.

To meet the Western demand, great numbers of the best animals to be found in Herefordshire were imported during the eighties. In fact, the very flower of the breed in its native land was practically transferred to Indiana, Illinois, Iowa, and Missouri pastures. Wealthy men, interested in good cattle, dipped deeply into their bank balances to induce the old-country breeders to part with their very best, and it was not many years before a distinct improvement over the old Herefordshire type became apparent.

Special recognition in this connection should be made to such pioneer importers and breeders as Gudgell & Simpson, of Missouri; C. M.

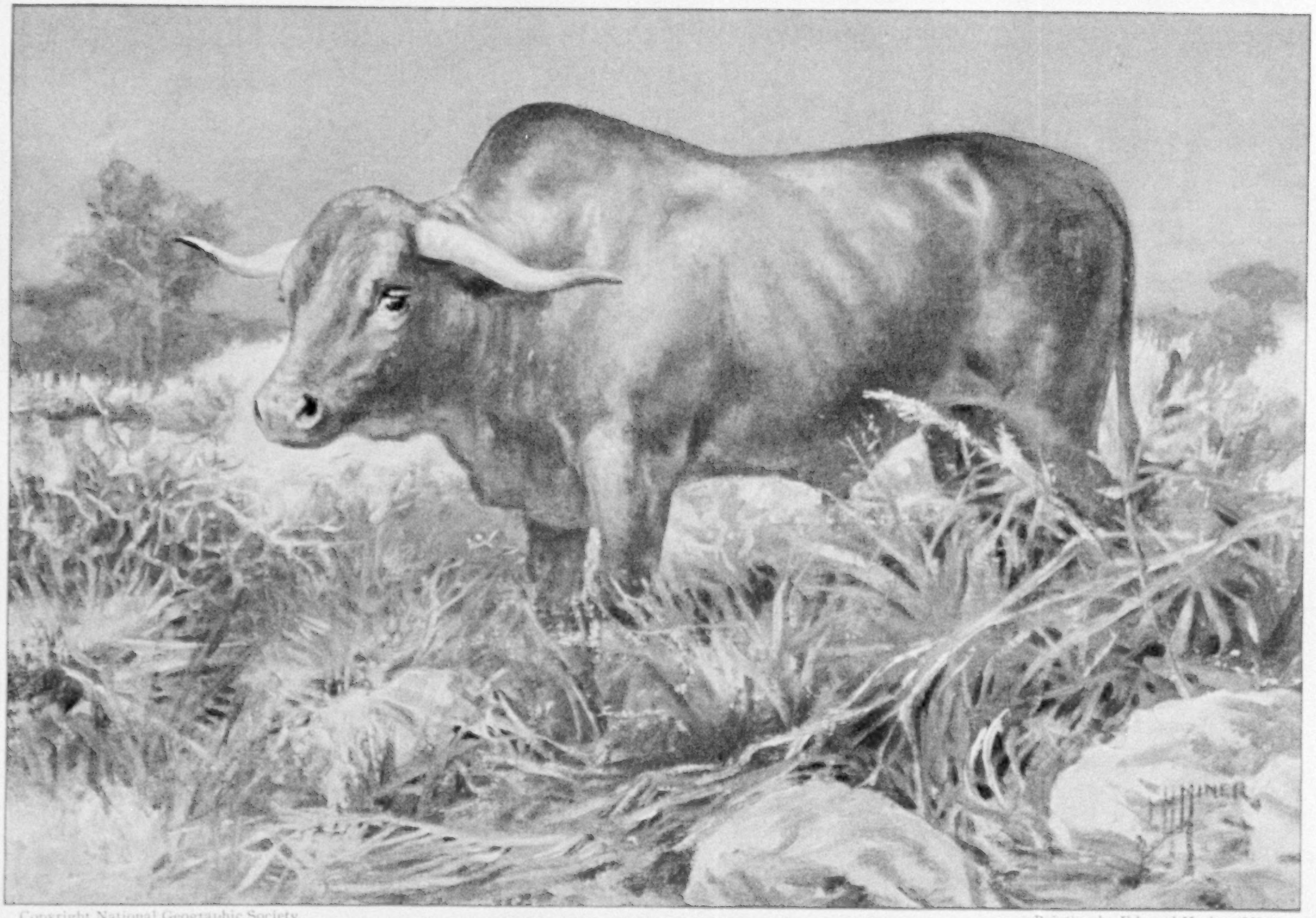
XUM



Copyright National Geographic Society

Painting from life by Edward Herbert Miner

RED POLLED NORFOLK BULL, AN IMPROVED BREED OF ENGLISH ORIGIN
ESTEEMED BOTH FOR BEEF AND FOR DAIRY PURPOSES



Copyright National Geographic Society — Painting by Edward Herbert Miner

RED AFRICANDER BULL, OF SOUTH AFRICAN CAPE ORIGIN, A BEEF ANIMAL

Culbertson and Thomas Clark, of Illinois; Earl & Stuart and William S. Van Natta, of Indiana.

American breeders essayed the task of introducing finer finish. The heads and horns, as well as the hind quarters, were improved, largely by resort to the concentration of blood of animals possessing the desired points, and at the present time it may be said that the American Hereford is more uniform in type and symmetry than his English progenitors.

The fact that 1,423,483 head of purely bred Herefords have been registered by the American Hereford Cattle Breeders' Association, and that this great expansion has taken place in comparatively recent years, demonstrates what a remarkable hold the "white-faces" have obtained in this their adopted country.

The secretary of the association, which boasts 12,208 stockholders and the patronage of 6,000 breeders not members of the organization, computes that there are at the present writing more than 400,000 registered Hereford cattle in the United States. He claims that there are more than 400,000 registered Hereford cattle service here—20,000 more than of any other registered beef breed—and 25 States are supposed to have more registered Herefords than registered cattle of any other beef breed. Good herds are still maintained in the New England States and steady progress is being recorded throughout the entire South.

In the Western America trade, Texas and the Southwest have become the favorite breeding grounds, although fine herds for the production of "seed stock" for use upon the range are also maintained in Colorado, Wyoming, Montana, and the Dakotas.

A dominant feature of cattle-feeding in the Corn Belt proper at the present time is the shipment of Southwestern-bred Hereford calves into the feedlots of the Central valleys, to be finished as "baby beef" for the Chicago, Kansas City, and Omaha markets.

In South America the Hereford is extensively used in connection with operations upon leading estancias in Argentina, Uruguay, and southern Brazil. In Australia and in the South African Cape colonies the breed has also been successfully introduced. In fact, wherever grass grows, and especially wherever a forlorn hope has to be led in range operations, the hardy Hereford has made fast friends.

POLLED HEREFORDS

In 1898, at the Trans-Mississippi Exposition, at Omaha, there were exhibited by W. W. Guthrie, Atchison, Kansas, under the name of Polled Kansans, some naturally hornless cattle carrying the color markings and possessing considerable of the type of standard Herefords. They were the result of mating purebred Hereford cows to a "muley" bull possessing a white face and red body, but of unknown ancestry, presumably, however, a Polled Shorthorn-Hereford cross.

Seeing these cattle, and also some crossbred Red Polled-Hereford calves on his own farm, gave Mr. Warren Gammon, of Des Moines, Iowa, the idea of the value of a naturally hornless strain of purebred Herefords, if it could be developed. Mr. Gammon learned that "sports," "variations," or "freaks" are constantly occurring among all species of plants and animals, and that by proper matings such "sports" can be propagated true to the new type. He therefore determined to search for such a "sport" purebred Hereford that would differ from the standard Hereford only in the lack of horns.

A circular inquiry, sent in the fall of 1900 to about 2,500 members of the American Hereford Cattle Breeders' Association, brought replies indicating that fourteen such hornless purebred and recorded Herefords were in existence, four being bulls and ten cows. The four bulls and seven of the cows were purchased as an experimental foundation herd.

In addition to the polled cows, a number of registered horned Hereford cows were mated with the polled bulls. The progeny from these matings showed that nearly all calves from polled sires and polled dams were hornless, as were about half those from polled bulls and horned cows. From this foundation herd the present breed or strain of Polled Herefords has been developed.

When it was demonstrated that polled bulls would sire polled calves from horned cows, the pioneer and his associates immediately assembled herds of registered horned Hereford females of desirable blood lines, and as fast as polled bulls were available they were put in service with these horned cows. The new strain was thus very rapidly increased in numbers until now, at the end of 24 years, there are upward of 50,000 Polled Herefords recorded in the American Polled Hereford Record.

Polled Herefords have spread into every State in the Union save Delaware and New Jersey, and have been exported to Canada, Mexico, South America, Hawaii, the Philippines, and Australia.

The American Polled Hereford Breeders' Association, the national breed organization, has enrolled more than 2,000 members, and there are in excess of 12,000 herds of cattle in the United States headed by Polled Hereford bulls.

Springing from "sports" occurring among purebred Herefords, the polled breed differs in no way from standard Herefords except in the possession of the polled character. With the recognized advantages of the hornless head in beef production, they have met with favor wherever introduced. Because of limited numbers and the resulting higher prices, they have only recently gone to the Western ranges in any considerable numbers, but during the last few seasons they have been in strong demand from that section.

THE JERSEY

(For illustration, see Color Plate XII)

On the French side of the English Channel, within sight of the west coast of Normandy, lie the Channel Islands. Formerly they be-

longed to France, but since the year 1204 they have been under British sovereignty. Of these islands, only four are important—Jersey, Guernsey, Alderney, and Sark—in the order given. It has been assumed that at one time these islands were a part of the French mainland.

Jersey is about twelve miles long and seven miles wide and contains nearly 40,000 acres. Its north shore consists of high cliffs, from which the land gradually slopes southward to St. Aubin's Bay and the city of St. Helier. The island is divided into twelve parishes and has a population of about 50,000. The climate is extremely mild and the island is a popular health resort.

Jersey is an agricultural island, some 25,000 acres being under tillage. Potato growing and the breeding of Jersey cattle are the two leading industries. The farms are small, commonly ranging from two to five acres, yet 500,000 bushels of potatoes have been harvested here in a season. Some 10,000 head of cattle are maintained on Jersey, in the open air most of the year, tethered on the rich pastures by a combination rope and chain fastened to an iron peg in the ground. Here they are systematically grazed, the tethered animal being moved forward to fresh grazing as the necessity arises.

The ancestry of Jersey cattle is obscure. It is commonly thought, however, that they are descended from French cattle; the fawn or white color has been attributed to the cattle of Normandy and the darker color to those of Brittany.

The people of Jersey many years ago recognized the value of their cattle and early adopted measures to protect the purity of the breed. As early as 1763 the island legislature prohibited importations from France. In 1789 a law was passed making importations from France, except for immediate slaughter, a crime. At the present time no cattle may be brought to the island except for slaughter within 24 hours.

A scale of points or a standard of perfection, now commonly applied to farm animals, first received serious consideration on Jersey. In 1833 the Royal Jersey Agricultural Society was organized and the following year a scale of points for the improvement of the cattle was adopted. The standard bull must score 25 points and the cow 27. At the first show held on the island, in 1834, the judges said that the cattle were of poor shape, that the cows had bad udders, and that some of the females had short, bull necks, were heavy of shoulder, etc. From time to time the score card was revised, a practice of rigid selection was followed, and the cattle steadily improved in beauty and productive merit.

The exportation of cattle from the island has been associated with their improvement. Even prior to the eighteenth century, Jerseys had been exported to England, where they were first known as French or Alderney cattle. Under the name of Alderney, the first Jerseys probably found their way to this country.

About 1821 Philip Dauncey, of England, began the development of a Jersey herd. He improved his cattle greatly through systematic breeding, and may be considered the first great constructive breeder of Jerseys. He maintained a dairy of 50 cows, each of which netted him an annual profit of $100 from sales of butter.

Jerseys were introduced to America very early in the nineteenth century, but no definite importation from the island seems recorded prior to 1850, when Messrs. Taintor, Buck, Norton, and other gentlemen near Hartford, Connecticut, imported a bull and several cows. Since 1850 many thousands of Jerseys have been shipped from their native island to America.

In general appearance Jersey cattle are lean and muscular, of dairy type, and are valued chiefly for milk production. Some of the more striking characteristics are as follows: The color is a fawn of some shade, such as brown, lemon, orange, gray, mulberry, black, etc. About the muzzle, around the eyes, along the back over the spine, down the inner side of legs, and about the udder the color changes to a lighter tint, approximating white on the legs. A solid color is most common and meets with great favor among Jersey breeders, but white spots of varying size are not unusual.

The skin, of a rich-yellow tint, is mellow and elastic. The head of the Jersey is one of its most attractive features, being lean and fairly short, graceful of contour, with prominent, expressive eyes. The fawn color, beautiful head, and graceful form of the young Jersey heifer has caused many to refer to her as "deerlike."

Jersey breeders have done much to develop a symmetrical udder, a model of its kind. In size, Jerseys at maturity range from small to medium, with 850 to 900 pounds for cows and 1,300 to 1,400 for bulls meeting popular favor.

Jerseys mature early and usually possess superior vitality, many cows of the breed having lived 20 years or more. The cows are mild and gentle of disposition, but the bulls at maturity are apt to be nervous and irritable.

Jerseys produce a grade of milk rich in butterfat, testing about 5 per cent. Remarkable yields are recorded of these cows. The American Jersey Cattle Club, the official supervisor of the breed in this country, provides a "register of merit," the cows being tested for milk and butterfat by representatives of agricultural colleges or experiment stations. In 1923 there were 3,250 cows tested, more than 300 of which qualified for gold or silver medals. Fauvic's Star holds the high milk record for the breed—20,616 pounds in a year—while Darling's Jolly Lassie, Groff's Constance and Princess Emma of H. S. F. have produced 1,141, 1,130, and 1,110 pounds of butterfat, respectively, in a year—most remarkable records.

Much has been done by various organizations to promote this breed. Besides the American Jersey Cattle Club, in 1923 there were 299 State and county clubs, 123 bull associations, and 213 boys' and girls' Jersey calf clubs. The American Jersey Cattle Club promotes the purity of the breed, and since 1871

XUM

Copyright National Geographic Society

Painting from life by Edward Herbert Miner

AYRSHIRE COWS, AN IMPROVED DAIRY TYPE OF SCOTTISH ORIGIN

Copyright National Geographic Society

Painting from life by Edward Herbert Miner

ABERDEEN-ANGUS, AN IMPROVED BLACK POLLED (OR HORNLESS) BEEF BREED OF SCOTTISH ORIGIN

has published some 106 volumes of Herd Books, containing the registration of more than 900,000 animals.

Jerseys are widely bred over the world, with many herds in the United States and Great Britain. There are nearly 20,000 breeders in this country alone, with Ohio and Texas leading. The wide distribution of the Jersey is evidence of its popularity and adaptability to varying climatic conditions.

Canada has long been noted for its Jerseys, but the largest herd in the world is located in the extreme south of Texas, not far removed from the Mexican border. In the East, in New England Jerseys have been preëminent for nearly three-quarters of a century, while some of the most noted herds on this continent are to be found in Oregon.

THE GUERNSEY

(For illustration, see Color Plate XIII)

An island in the English Channel, with an area of only 24 square miles and only about 10,000 acres of productive soil, inhabited by a thrifty race of French descent, noted for its mild climate, its gardens, its greenhouses, its granite quarries, and, above all, for its cattle! Such is the seagirt home of the "golden Guernsey" cow.

As an object lesson in what may be achieved through intelligently directed "community spirit," concentrated upon the production of something possessing outstanding quality, the creation of the Guernsey breed of cattle, now enjoying such deserved popularity in the United States, must be set down as one of the great achievements of modern husbandry.

Guernsey cattle are fawn-colored, marked with white, and are larger than their widely distributed sister breed of Jersey. They possess a peculiarly rich-yellow skin, this coloring in some subtle way extending to the lacteal products in such marked degree that the milk, cream, and butter are in broad demand, at top prices, wherever produced. In fact, the Channel Island farmers have always laid great stress upon the relationship of the color of the skin to the color of the butter. The first scale of points prepared by the breed societies of the different islands, published about 100 years ago and revised in 1840, shows that practically the same scale was used by the entire group, and that all emphasized the yellow skin as indicating the production of yellow butter.

The first cattle from the Channel Islands, all then known as Alderneys, reached the United States more than 100 years ago. They were brought over either by travelers, who, visiting the islands, fell in love with the yellow milk and butter, or by skippers who had been similarly impressed.

The earliest importations into America of cattle whose records were completed, so that their descendants might eventually be registered, were made in 1830 and 1831. These cattle were maintained on Cow Island, in Lake Winnipesaukee, New Hampshire, without mixture of other blood, and among their descendants was a cow that twice won a grand championship. The next importation of which there is record was in 1840, and this was followed by others in the fifties and sixties, but not until about 1880 did Guernseys come to America in any great numbers.

In 1881, S. C. Kent and a number of his Quaker neighbors in Chester County, Pennsylvania, began importing Guernseys and selling them at public sale, bringing over more than 1,000 in the course of 10 years. In the nineties and for the decade following, only a few were imported each year, but about 1908 they began to come over in much larger numbers and in recent years importations have been numerous.

Nearly all of the earlier imported cattle went into the hands of wealthy men, who had country estates around the large cities in the East, principally Boston and Philadelphia. They began to come into the West in the early eighties, and at once became popular in the dairy sections.

Wisconsin now has about one-quarter of all the purebred Guernseys in the country. Pennsylvania, New York, and Minnesota follow, while representatives of the breed are to be found in every State in the Union. Nearly 100,000 bulls and 175,000 females have been recorded.

The generally accepted statement as to the origin of the Guernsey is that it is a cross between the large red cattle of Normandy and the small yellow and red cattle of Brittany. It seems certain that up to about 100 years ago the cattle on all the Channel Islands were practically of one type, and were at that time being shipped in large numbers to England.

Records show that from 1822 to 1826, inclusive, 184 bulls and 10,575 cows were exported from the Channel Islands to England. Even the cattle that were exported to England from Normandy were also referred to as Alderneys when they reached Great Britain.

The development of the breed on the Island of Guernsey, until very recent times, was largely along show-yard lines. Records do not tell when the first public exhibitions were held, but it certainly was as far back as 1842. The earliest photographs of the breed were made about 1865, but paintings and engravings were made much earlier and indicate that the cattle were rough and angular.

At least two shows are held on Guernsey each year. The most coveted prize is the King's Cup for the best cow and best bull, and the owner of a bull winning a King's Cup, if he accepts it, must let the bull stand on the island for public service for the next year at a very nominal fee, and if the animal is sold from the island before the year is up the cup is forfeited.

The one thing which, perhaps more than any other, has aided in the improvement of the Guernsey breed is the rule that no bull could stand for service on the island and the progeny be recorded if used before 15 months of age, or if used before he had been approved for service and his dam be either a prize winner at the shows or be approved by the committee at the time the son was approved for service.

In recent years the additional requirement has been made that the bull must be out of a cow with an official record.

Following the establishment of yearly official testing in America in 1901, the island Guernsey societies adopted rules along similar lines, and since that date several hundred yearly records have been completed on the island, revealing a production ranging up to 899.48 pounds of butterfat. Until recent years the island cows had practically nothing but pasture in summer and almost exclusively roots and hay in the winter, but now grain is fed, especially to cows making records.

The American Guernsey Cattle Club was organized in 1877 by a few breeders living in the Eastern States. The scale of points in use by the club has been revised three or four times. In 1898 it offered some prizes for yearly butter records made on the owners' farms and somewhat supervised by State experiment stations. The first year's work brought out the record of 783.7 pounds of fat for the cow Lilly Ella, owned in Wisconsin, and her half-sister, Lilyita, made 710 pounds of fat. These records were so remarkable that they attracted general attention, and following the completion of that year's work the club adopted rules for an Advanced Registry based on yearly semiofficial tests.

Of these annual records 17,651 had been approved up to May 1, 1924, and they show an average of 9,443.48 pounds of milk and 471.34 pounds of fat. The largest milk record for the breed is Murne Cowan's production of 24,008 pounds of milk, with 1,098.18 pounds of fat, which is the second largest fat record of the breed. The largest fat record is Countess Prue's, with 1,103.28 pounds.

THE ENGLISH LONGHORN

While this picturesque, old-fashioned British breed is still to be seen in its native land, and while specimens were imported into the United States along with the Herefords and Shorthorns, brought into Virginia and Kentucky more than a century ago, it has never regained the popularity it once enjoyed in the English Midland counties.

It is a dual-purpose type, possessing scale and dairy capacity, and takes its name from its peculiar wide-branching (and frequently downcurving) horns. At one time they were known locally in Lancashire as "Wag Horns," because of the manner in which the horn bent underneath the eye. Specimens are still to be seen with horns thrown outward and downward alongside the head, constituting an almost circular "frame" for the face. Ordinarily, however, the horns start laterally from their base, taking various twists as they develop.

The Longhorn seems to have been developed originally in the northwestern parts of England, and was once common on the plains and in the mountains of Ireland. In England it was found in Lancashire, Cumberland, and Westmorland; and, in fact, to the south as far as the Bristol Channel. The prevailing colors originally were black and brown, with more or less white on the body and a streak of white down the back.

The Longhorn had been improved by selective matings in the Midlands long before Bakewell made them the basis of his extended experiments in pairing animals of near kin. In fact, he selected the breed for his projected manipulations because at that time (1755) it was the most popular type of the time in the central counties. He sought specifically to produce cattle with less carcass waste, maturing more rapidly than the old type.

Dairy quality Bakewell ignored, saying, "All is useless that is not beef." He sought to change the conformation, so as to develop those parts most valuable upon the block, the back and hind quarters. The exact extent to which he carried incestuous matings in pursuit of his object he never made fully known. In fact, his practices were at first so sharply criticized by his contemporaries that he maintained secrecy even with his own herdsmen. He experimented with Leicester sheep at the same time along similar lines, and one trusty old shepherd was the only person who really knew what was going on.

Bakewell held to his own course, despite ridicule and predictions of failure, and while the particular breeds with which he wrought never attained the popularity of certain contemporary types, it was the practical application of his method to the Shorthorns, Herefords, and other races that gave modern English cattle breeding its first great impetus.

In the fells of Westmorland and Cumberland the Longhorn was highly regarded because of its hardiness, thriving in the hill country, even through the winter months, without roots or shelter. It had a thick hide and strong coat, but did not reach maturity at so early an age as the Shorthorn, Hereford, and other contemporary breeds.

The breed has undergone various modifications in color. Dark roan, with black "ticks" and white line along the back was popular for years. Formerly a bluish tint was in favor, but a dark red, brindled or grizzled, with the white line on the back, has in recent years been more popular with those who still adhere to the type.

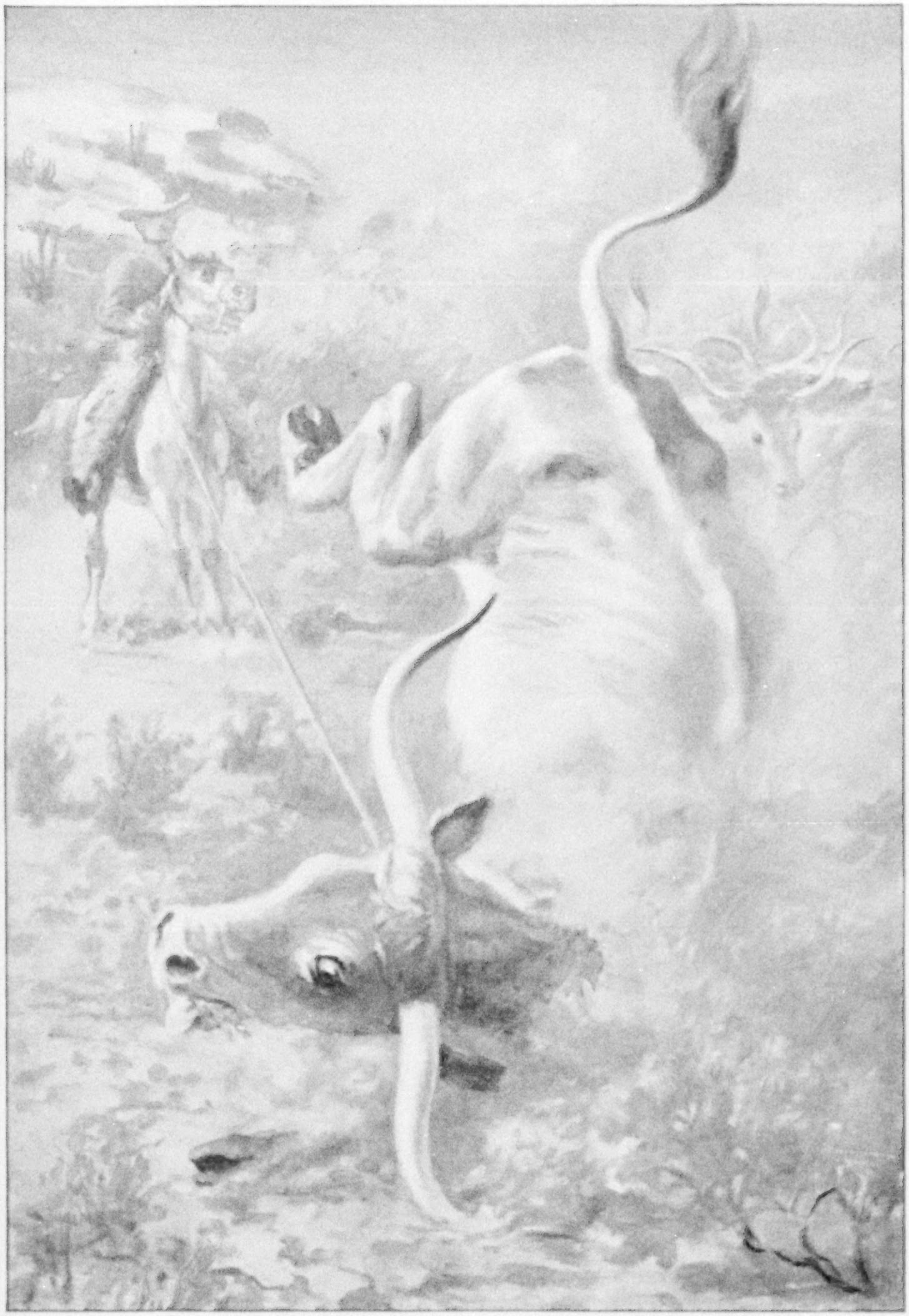
Professor Robert Wallace, of Edinburgh University, in his "Farm Live Stock of Great Britain," says:

"As dairy cattle, they frequently produce from 14 pounds up to 17 and 18 pounds of butter per week on ordinary pasture. Good cows will give on an average about eight quarts of milk twice daily. Greater attention is now paid to them, owing to the relatively higher prices given for milking cows, especially for cheese dairies, than for butchers' beasts."

DEVONS

(For illustration, see Color Plate XIV)

Devonshire has long been famous as the home of a breed generally recognized as one of the oldest distinct types of improved cattle in Great Britain. The Devons are commonly classified with the Sussex and Herefords in respect to ancient derivation, and have for generations existed in two forms, the North Devon and the South Devon (or South Ham) varieties.



Copyright National Geographic Society Painting by Edward Herbert Miner

TEXAS LONGHORN, OF SPANISH ORIGIN

In the hills of North Devon, extending from Barnstaple to Minehead and on into West Somersetshire, the North Devon is the pride of the countryside. All red, with neat bone and well-spread ribs, the "rubies," as they are often called in bovine parlance, not only make up into bullocks that are prime favorites in the Smithfield market, but the cows are noted for their pronounced dairy quality.

Smaller than the Hereford and Shorthorn, the Devon is perfectly adapted to grazing in a hill country, and has found favor in many parts of the world, including the United States, New South Wales, the African Cape, southern Brazil, and Uruguay.

The South Devons are larger than the Northern type and are lighter in color. The North Devon is a deep rich red, sometimes with curly hair, which is in favor. The Southern variety has a yellower hide and heavier bone, but lacks the refinement of its cousins of the higher-lying pastures.

Francis Quartly, a North Devon man, is credited with having wrought as great an improvement in the Devon breed as the Collings did with the Shorthorn, or Tomkins with the Hereford. He adopted the Bakewell concentration policy and with immediate results, securing both uniformity and prepotency. His active creative work covered the period from 1793 to 1823, and his herd became the chief source of supply for stock bulls for the entire district. His practice was to use only bulls of his own breeding, buying females for fresh blood when deemed desirable.

Quartly continued his herd for 43 years, retiring in 1836 in favor of his nephew, John Quartly. This rare old Devon worthy lived to the age of 92, and his name stands high in the list of Britain's foremost constructive cattle breeders.

The earliest known importation of Devons into the United States was that made in 1817 by Robert Patterson, of Baltimore. Strangely enough, these were not from Devonshire, but from a splendid herd that had been established in Norfolk by the Earl of Leicester. The total registrations in the Herd Book of the American Devon Cattle Club are: 9,638 males, 16,660 females, nearly three times as many animals of each sex having been registered in 1925 as in 1924.

Devon milk is rich in butterfat and "Devonshire clotted cream" is famous on both sides of the Atlantic.

WEST HIGHLANDERS

(For illustration, see Color Plate XV)

In the heather-topped mountains and wooded glens of Scotland the West Highland cattle have their home. Dotted here and there over the wild expanse of the counties of Argyll, Inverness, and Perth rise the summits of many peaks, culminating at 4,406 feet in Ben Nevis, the highest point of land on the British Isles. It is a country of brawling streams, of grassy hillsides, isolated farms, and a widely scattered population, where the very elements tend to create in an unusual degree in both man and beast the spirit of self-reliance and independence.

Under such conditions has developed the West Highland breed of cattle, a type well suited to its rugged surroundings. Its origin goes back to prehistoric days of *Bos longifrons* from which many British breeds sprang (see text, page 645). Professor Wilson regards them as descendants of the black cattle which the Celts drove into the west and north when they retired before the English.

Little, however, is known of their history until relatively recent times, and in their present form one may be justified in regarding many of them as aboriginal in type, far removed in domesticity from our more improved breeds.

A typical West Highland animal, with wide-spreading, formidable-looking horns, long, shaggy coat of hair, and toplofty, independent carriage of head, makes an impressive picture on the landscape. James Cameron, a Scotch breeder, says: "A really good Highland bull in full October or November coat is one of the noblest and most picturesque of animals." On his native mountain side, he has been a favorite subject with artists. Even on the lowlands of England, small herds are pastured on the parks of the nobility, where they add a new charm to the scene.

West Highland cattle vary in color, being yellow, red, black, brindle, and a mixture of red and black. The hair at its best consists of a fine, very thick undercoat, and a long outer covering, through which the rain rarely penetrates. On the forehead, top of neck, and thighs the hair is extremely long and coarse. On the London market West Highland beef is ranked of premier quality, fine of grain, and unsurpassed in flavor.

No other breed of British ancestry equals the West Highland for hardiness and capacity to withstand winter exposure. It is a comparatively small breed, the cow averaging perhaps 900 pounds and the males 1,200, as one sees them on the hills. Reared under difficult conditions, inured to exposure, and getting most of their sustenance on the mountain sides, they are slow to mature.

Few of these cattle have found their way from the Scotch Highlands, for they do not satisfactorily adjust themselves to strange conditions. An occasional small importation has been brought to America, where for a time they have been viewed as curiosities and then have disappeared.

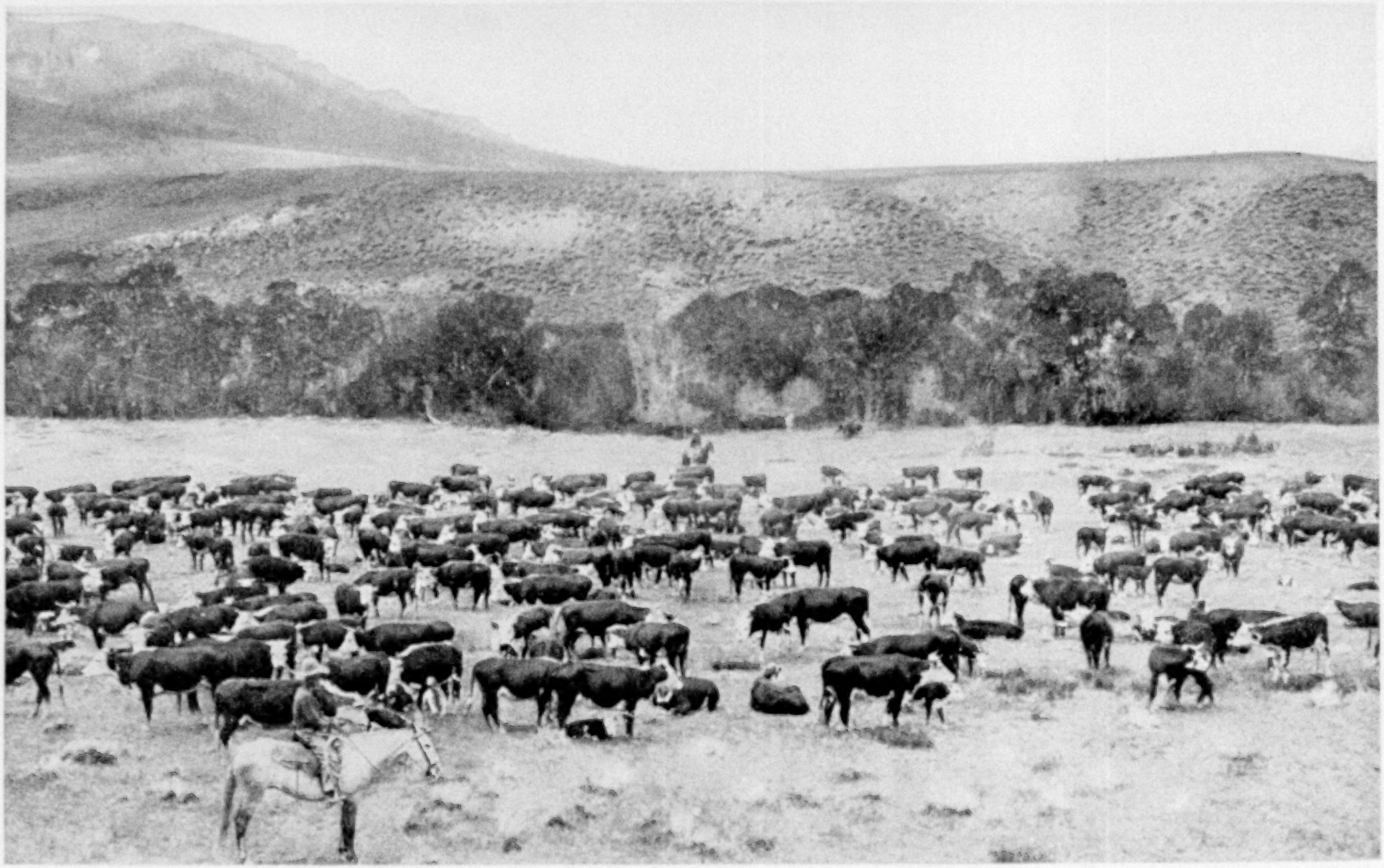
In 1884 a West Highland Cattle Society was organized in Scotland. It publishes a Herd Book and promotes the welfare of the breed.

FRENCH CANADIAN

In his "Pioneers of New France," Francis Parkman says:

"In 1518 Baron de Léry made an abortive attempt at settlement on Sable Island, where the cattle left by him remained and multiplied." This is the earliest recorded shipment of French cattle to the New World.

The foundations of cattle breeding on the mainland were not laid, however, until a century



Photograph by Charles J. Belden

"WHITE-FACES" ON THE RANGE

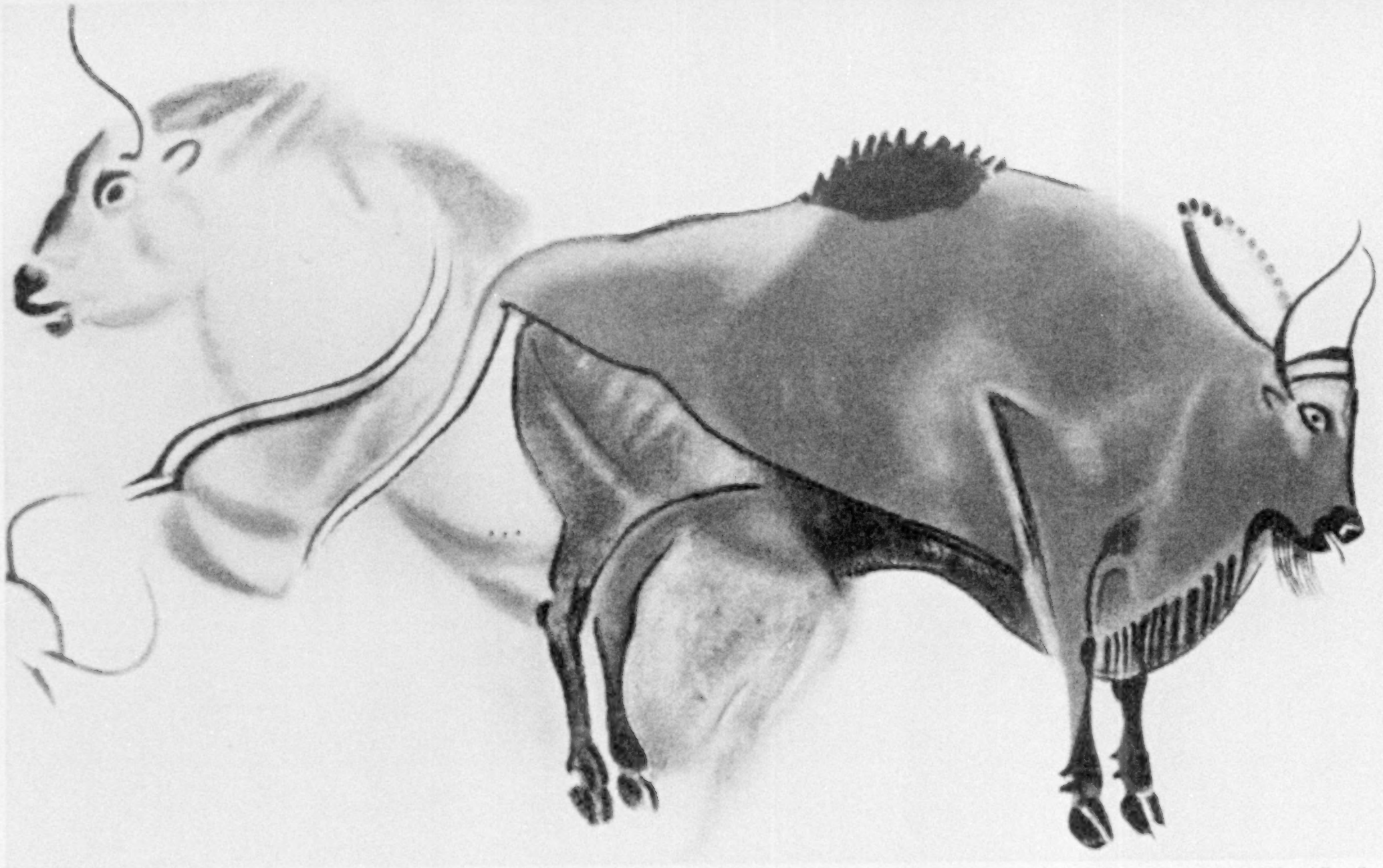
Herefords and Hereford grades may be seen everywhere on Western ranches. On account of their hardiness and rustling quality, they were admirably adapted to meet the hard conditions existing when the herds were maintained on the open range. With the advent, however, of fenced pastures and irrigation in the valleys, the other beef breeds are also now strongly supported in various sections. The Hereford's reputation as a grazer, however, is possibly not equaled. His ability to make beef off grass has made him famous (see text, page 630).

UM

© Charles J. Belden

THE BRANDING

One of the most important operations on the Western cattle ranges is the branding of the calves. Begun in the spring, it is followed up, as necessity requires, until winter sets in again. Although most of the herds are now behind fences, the branding of the calves is still regarded as a necessary measure of protection and identification.



Photographic copy of painting by l'Abbé Henri Breuil

COPIES OF PREHISTORIC DRAWINGS OF A MALE AND FEMALE BISON ON THE WALLS OF A CAVE OF ALTAMIRA, NEAR SANTANDER, SPAIN

These paintings, estimated by some anthropologists as being perhaps 25,000 years old, are among the many interesting relics of early man found in the caves and grottoes of the Pyrenees. The cave at Altamira was discovered in 1875, but not until four years later was it known that prehistoric pictures decorated parts of its rocky walls and ceiling. The figures are painted on stone in red, black, and brown, and, because of the almost complete absence of light in the cavern, the colors are as vivid as if recently applied.

later. In 1620 a few cattle were landed at Quebec, and in 1665 Messrs. Tracey and de Courcelle brought from France a small shipment described as black and brindle in color. These early selections were from Brittany, Normandy, and probably from the Island of Jersey, and their descendants to this day are not unlike the darker Jerseys in coloring.

The climate and grazing of the Province of Quebec called for an active, hardy race, and under the name of French Canadian the farmers of that district have persistently adhered to these diminutive but exceedingly efficient cattle. Although weighing only from 700 to 1,000 pounds, the cows, with liberal feeding, will yield up to 5,000 to 6,000 pounds of milk per year, which tests frequently from 4 to 5 per cent fat.

This breed illustrates admirably the success with which types of cattle suited to any environment may be perfected. The French Canadian cows thrive and yield their good flow of rich milk upon such scant herbage that most other breeds would find it utterly insufficient.

At the present time dark brown is the favored color, but black, brown or fawn, with a brown or fawn stripe along the back and around the muzzle, is accepted. Calves are often somewhat yellow in color when born, but generally undergo a definite change as yearlings.

The cows are noted for the persistency of their milk yield. This fact finds illustration in the case of one registered as Adaline 5350, who, in her three-year-old form, under official test produced 8,705 pounds of milk in 12 months, showing 371 pounds of butterfat, and gave 494 pounds of milk during the last month of the test.

Attention was attracted in the United States to the utility of French Canadian cows through a remarkable showing in economical production made in a comparative test conducted during the Pan American Exposition, at Buffalo, in 1901. They have been imported into our Northeastern States to a limited extent, and a registration has been established for them both in the United States and the Province of Quebec.

RED POLLS

(For illustration, see Color Plate XVI)

This useful and popular dual-purpose breed in its present form represents a blending of the old hornless red stocks of Norfolk and Suffolk, England. Hornless, or polled, cattle seem to have existed in those districts from time immemorial. The probability seems to be that they were introduced soon after the Roman occupation.

Originally there was much variance of type in the two varieties. The Norfolks were a small, hardy, and thriving breed, neat-boned, short-legged, round-barreled, and strong-loined, fattening easily and producing an average flow of high-quality milk. The Suffolks were of larger frame, rougher in appearance, having flat loins, with prominent hip bones and tail head. They were exceptionally heavy milkers, but the quality of the milk was not so good as that of the Norfolks.

The merging of these two strains, beginning about 1846, proved the foundation of the present breed. It has been the aim of the successful breeders and showmen to combine the good qualities of both of the old strains, and produce a cow of medium to large size, blood-red in color, of fine bone, smooth and compact in form, hardy, docile—one that will fatten easily, producing meat of high quality, and a cow that will give a good flow of rich milk all the year round.

There seems little doubt that our so-called native American "muley" cows are descendants, more or less mixed with other strains, of Norfolk and Suffolk cows brought over by early English emigrants.

The persistence with which the old Suffolk traits are transmitted, under what would seem adverse conditions, finds a striking illustration in what were known in Massachusetts as "Jamestown cattle." In 1847, during the famine in Ireland, the people of Boston sent a shipload of provisions to that country to relieve the distress. As a token of appreciation, a Mr. Jeffries, living near Cork, presented to the captain a Suffolk polled heifer. She was delivered by him to the donors of the provisions and was sold at auction for the benefit of the fund.

This cow proved to be a remarkably fine milker, and her progeny (mostly bulls by what were then known as Alderney sires) were largely used in the dairy herds around Boston.

The progeny of these half-blood Suffolk bulls were nearly all hornless and were so superior to the ordinary cattle of the district as to become noted. They derived the pseudonym Jamestown from the name of the vessel in which the heifer came over, and at several local fairs were shown in considerable numbers.

A. W. Cheever, agricultural editor of *The New England Farmer*, acquired a small herd of them, and after 15 years' experience said:

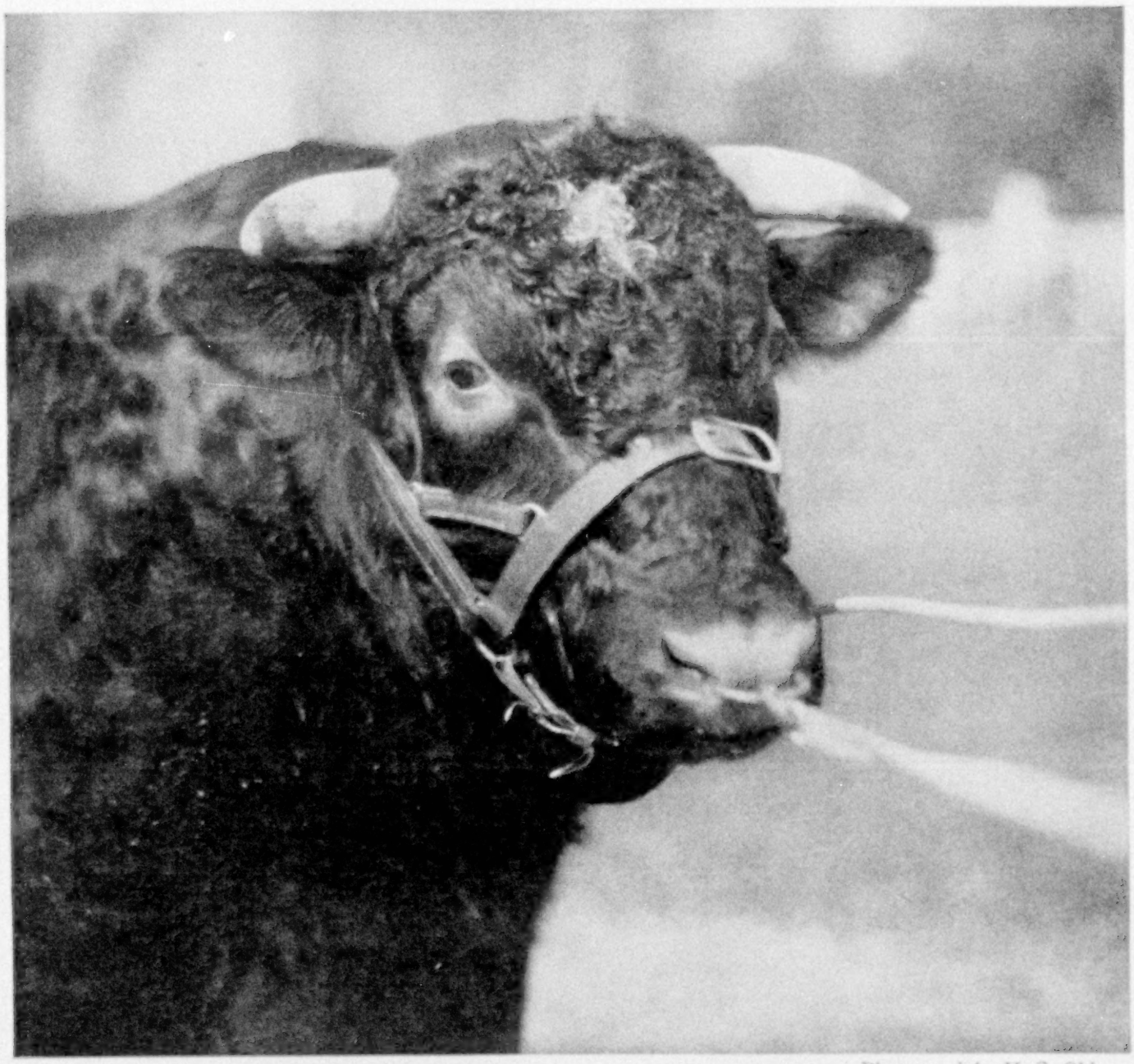
"We were thoroughly converted to a full faith in the superior qualities of the polled cow as a domestic animal."

While it is probable that various sporadic importations of the Red Polls had been made in Colonial days, the first historic importation for breeding purposes was made by G. F. Taber, of New York, in 1873. This consisted of a bull and three heifers. In 1875 he imported four cows in addition, and in 1882 three bulls and twenty-three heifers. During that same year Mead & Kimball, of Vermont, imported a bull and ten females, and in 1883 G. P. Squires, of New York, and Geldard & Busk, an English firm, made importations.

Thereafter the number brought over increased rapidly from year to year until about 1900, when the prices on the other side became so high that few importations have since been made.

The Model Dairy conducted at the Pan American Exposition at Buffalo in 1901 gave the first opportunity for Red Polled cows to compete with other breeds in economical production of milk and butterfat. There were ten breeds competing, and the Red Polls won fifth place. In individual cows Red Polls won second place, with a net profit of $52.10. First place went to a Guernsey cow, with a net profit for the six months of $59.41.

In this test all the Red Polled cows entered



Photograph by H. G. Olds

A $60,000 SHORTHORN BULL

This two-year-old bull won the grand championship in the Argentine National Show of 1925, and subsequently was sold at auction for a record price, the equivalent of $60,000 American gold. More than 1,000 head of Shorthorns were on exhibition, the largest display of show cattle of any breed held in the world.

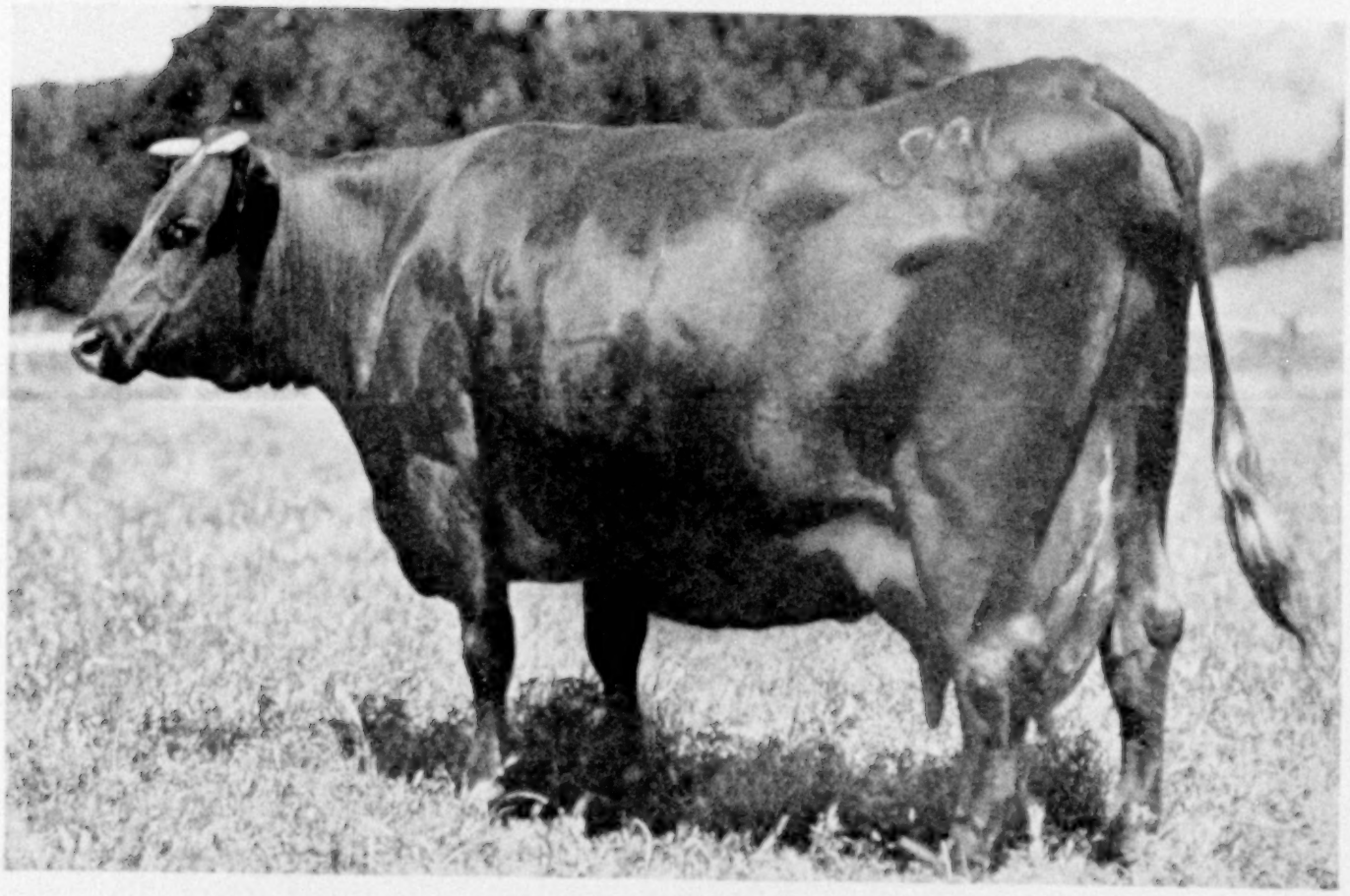
were from one herd, and they had been in lactation from 42 to 70 days when the test began. Many of the breeds in competition with them had special experts traveling all over the country, selecting cows here and there; so, for competitors upon that occasion, the Red Polls were contending against picked individuals selected from the best herds of the entire country.

The inauguration of the Farmer's Cow Contest at the International Live Stock Exposition in Chicago in 1902 again gave the breed an opportunity to show its dual characteristics in competition with other breeds. The rating in this contest was as follows: Butterfat record of each cow during the period of lactation was to count 35 per cent; her individual merit, 25 per cent and her calf, 40 per cent. Red Polls were the winners in this contest in both 1902 and 1903, the only years that these classes were given.

In 1908 the American breeders established their score card and standard description, and this has been followed in both the showring and in making selection of breeding animals, thus standardizing type. During that year also the Red Polled Cattle Club inaugurated the Club Milk Test. The present world's official record for a Red Polled cow for twelve consecutive months is 20,280.6 pounds of milk and 891.58 pounds of butterfat. This record is held by Jean Du Luth Beauty.

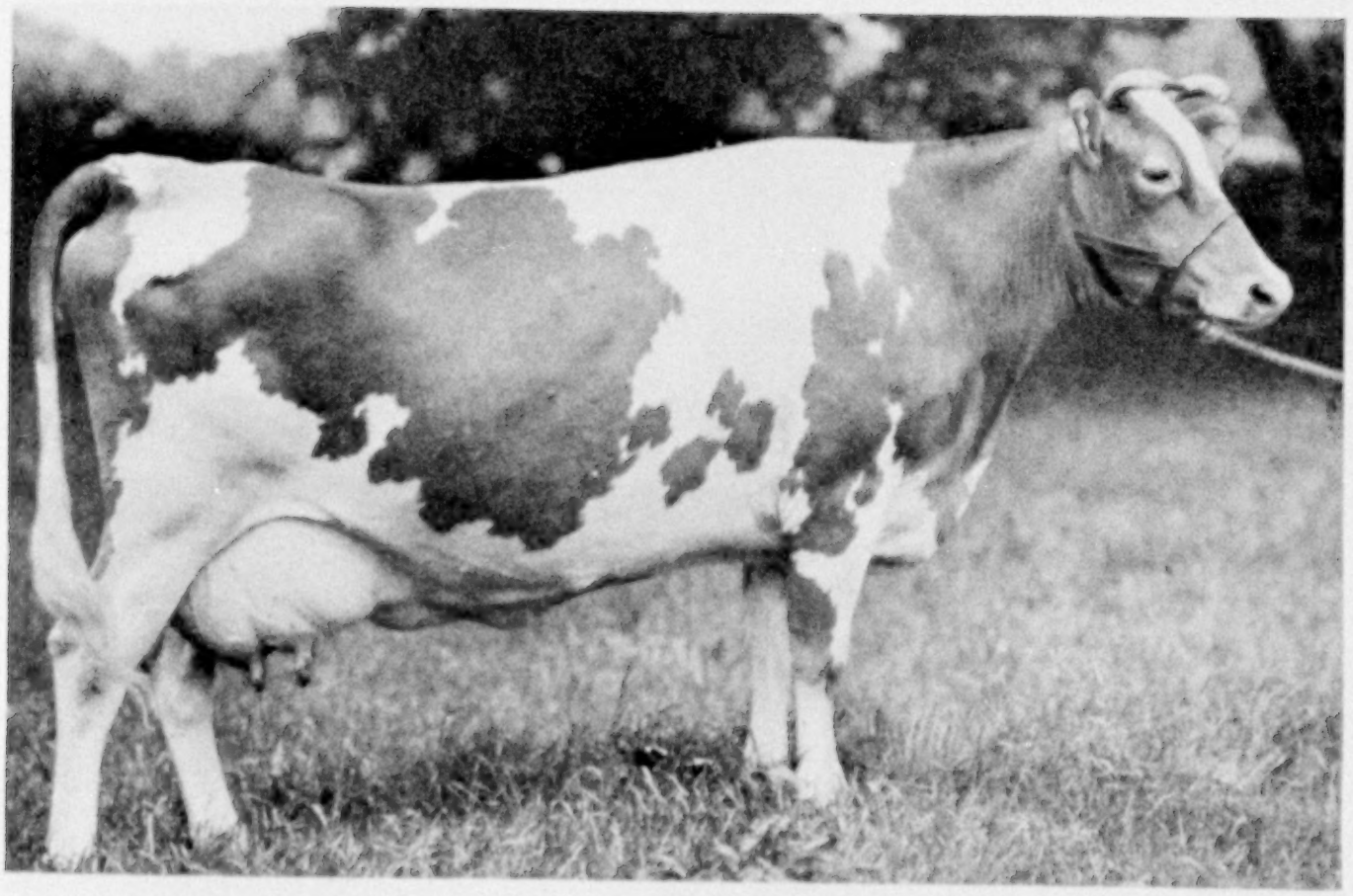
The carcass classes at the International Live Stock Exposition at Chicago have developed valuable information. For a number of years Red Polls have been entered in these classes. The majority of entries of Red Polls in the carcass classes have been made by farmers who have bred, fed, and exhibited their own cattle.

In 1922 Red Polls won first in the senior yearling class and second in the junior yearling



THE WORLD'S CHAMPION DAIRY COW

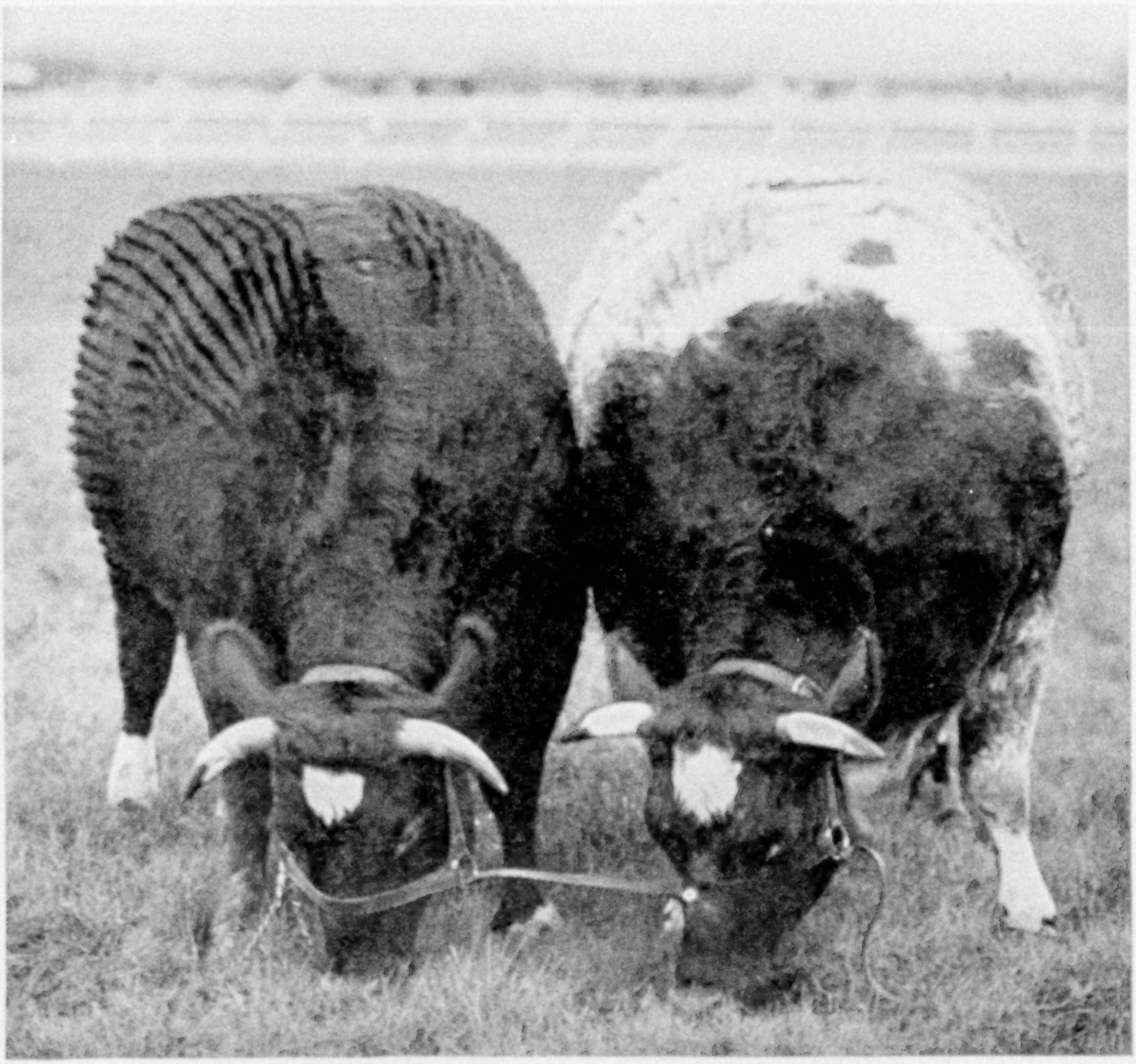
The Australian-bred Shorthorn Melba 15th, of Darbalara, produced under official test during a 12-months' period 32,522 pounds of milk yielding 1,614 pounds of butterfat—a world's record for total production over all breeds.



Photograph by Robert F. Hildebrand

THE NEW QUEEN OF THE GUERNSEY WORLD

This cow, Anethesia's Faith of Hill Stead, has recently finished a year's official test, which is 19,741.7 pounds of milk and 1,112.5 pounds of butterfat.



A PAIR OF SHORTHORNS ALL "DOLLED UP" FOR THE SHOW

These heifers illustrate the beef type of a dual-purpose breed. Note the herdsman's work upon the coat of the red beauty on the left, preparatory to sending her into the showring.

class. These steers sold for 31 and 35 cents a pound, respectively, the highest prices ever received for any steers in the show, except the grand champion.

The dressing percentage of the senior yearling steer was 62.76 per cent, while that of the junior yearling was 64.95 per cent. As this competition included 52 entries from the herds of our greatest beef producers and from a number of agricultural colleges as well, the fact that the Red Polls were able to win these places with steers bred, fed, and exhibited by a farmer-owner shows the possibilities of the breed for the production of a choice quality of beef.

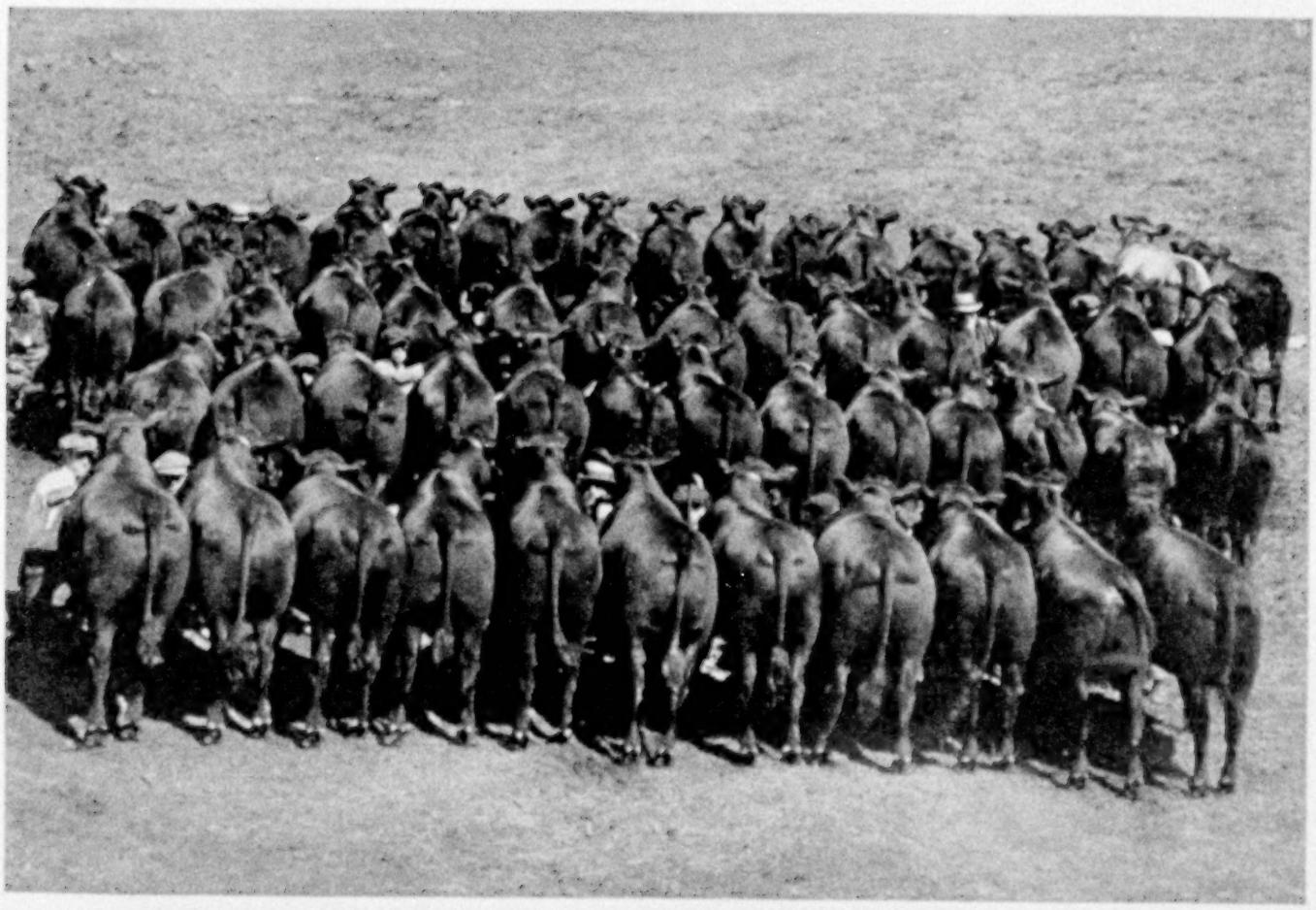
The usefulness of this breed is now well known the world over. Exportations have been made from England not only to the United States, but into Canada, South Africa, Australia, New Zealand, South and Central America, Mexico, Alaska, Hawaii, and Jamaica.

Until the World War, not many Red Polls were found in England outside of the native counties of Norfolk and Suffolk, but the conflict brought about some notable agricultural readjustments, and, among others, a wider distribution of the Red Polls in various parts of England, Scotland, and Ireland.

The number of animals recorded in America to date is 48,397 bulls and 68,957 females. Of these, approximately 43,000 bulls and 58,000 females were American-bred animals.

SUSSEX

This English breed, found in Sussex, Kent, Surrey, and Hampshire, is obviously descended from the same parent stock as the Devonshires. Some authorities trace an ancestral relationship between the Sussex, the Devon, the Hereford, the Welsh, and the West Highlander. The Sussex has longer and stronger horns than the Devon. It is dark-red in color, is larger and heavier-boned than the Devon, and is valued



Photograph by Dave Risk

ABERDEEN-ANGUS BABY BEEVES

These calves were fed and shown by the boys' and girls' club members at a recent Iowa State fair and illustrate the type of beef cattle now commanding high prices in all central markets (see text, pages 632-633).

chiefly as a good grazer where beef rather than milk is sought.

In the district in which it is bred there are large areas of stiff, heavy-working soils, calling for great strength at the plow. The Sussex oxen were at one time extensively used as draft animals by these South of England farmers. They are a sturdy breed, and the British have introduced them successfully into South Africa.

In 1884 Mr. Overton Lea, of Nashville, Tennessee, made an importation of Sussex, and for some years maintained a good collection of the breed. The descendants of the Lea importations were distributed in various Southern States. Sussex have also been bred sparingly in Maine and in the Dominion of Canada. Mr. Lea made several notable exhibits of bullocks at the Chicago Fat Stock Shows of the eighties, his animals winning numerous prizes, and their showing of finely marbled beef on the block attracting much attention.

The Sussex has not attained any general distribution in the United States.

KERRIES AND DEXTERS

Kerry cattle as a distinct breed have existed in Ireland from very remote periods. In an address prepared for the Royal Dublin Agricultural Society some years ago, Professor James Wilson declared that "the Kerries are all now left of the races that once inhabited the whole island, but which have been gradually pushed out by imported cattle."

This conclusion is apparently substantiated by the fact that it is only in the mountainous districts of the County of Kerry and on the Berehaven Peninsula, in County Cork, that the breed is still to be found as the ordinary commercial cattle of the country, reared and found upon practically all holdings.

Herds of carefully bred specimens, now having registration in the office of the Kerry Cattle Society of Ireland, are to be found in various parts of Great Britain, but these are of comparatively modern establishment.

It is commonly conceded that the native Irish cattle were originally all black, and that is the color of the Kerries of to-day. Reddish-browns appear at times, and now and then a few white markings develop, but these are not approved by the breed association.

Kerry cattle are diminutive, averaging around 900 pounds, but for generations they have been loved by the Irish cottagers because of the capacity of the cows for producing a good flow of rich milk at a minimum cost. There is record of one herd, kept for 12 years, having an average yield of more than 600 gallons of milk with 4 per cent of butterfat. Records published by the Kerry association demonstrate surprising capacity at the pail, individual cows yielding up to 8,550 pounds in 12 months.

Twelve cows averaged between 6,000 and 7,000 pounds; 43 between 5,000 and 6,000 pounds. Butterfat percentages ran remarkably high, 8 cows averaging over 5 per cent and 62

© H. Armstrong Roberts

WEEK-OLD TWINS: AYRSHIRE CALVES FROM ONE OF PENNSYLVANIA'S FINEST HERDS

between 4 per cent and 5 per cent. There is also record of an extraordinary cow (Kilmorna Waterville 1st) that produced 11,126 pounds of milk in 1913, yielding 5½ gallons per day for several months after calving.

The globule of the fat in Kerry milk is smaller than in most other breeds. The cream when set, therefore, does not rise so fast; hence the Kerry's reputation for "sweet milk." Butter made from the milk is also considered particularly "sweet." The cows carry upstanding, slender white horns, with black tips which often turn back. The bull's horns are shorter than the cow's and are commonly erect, with tips turned back.

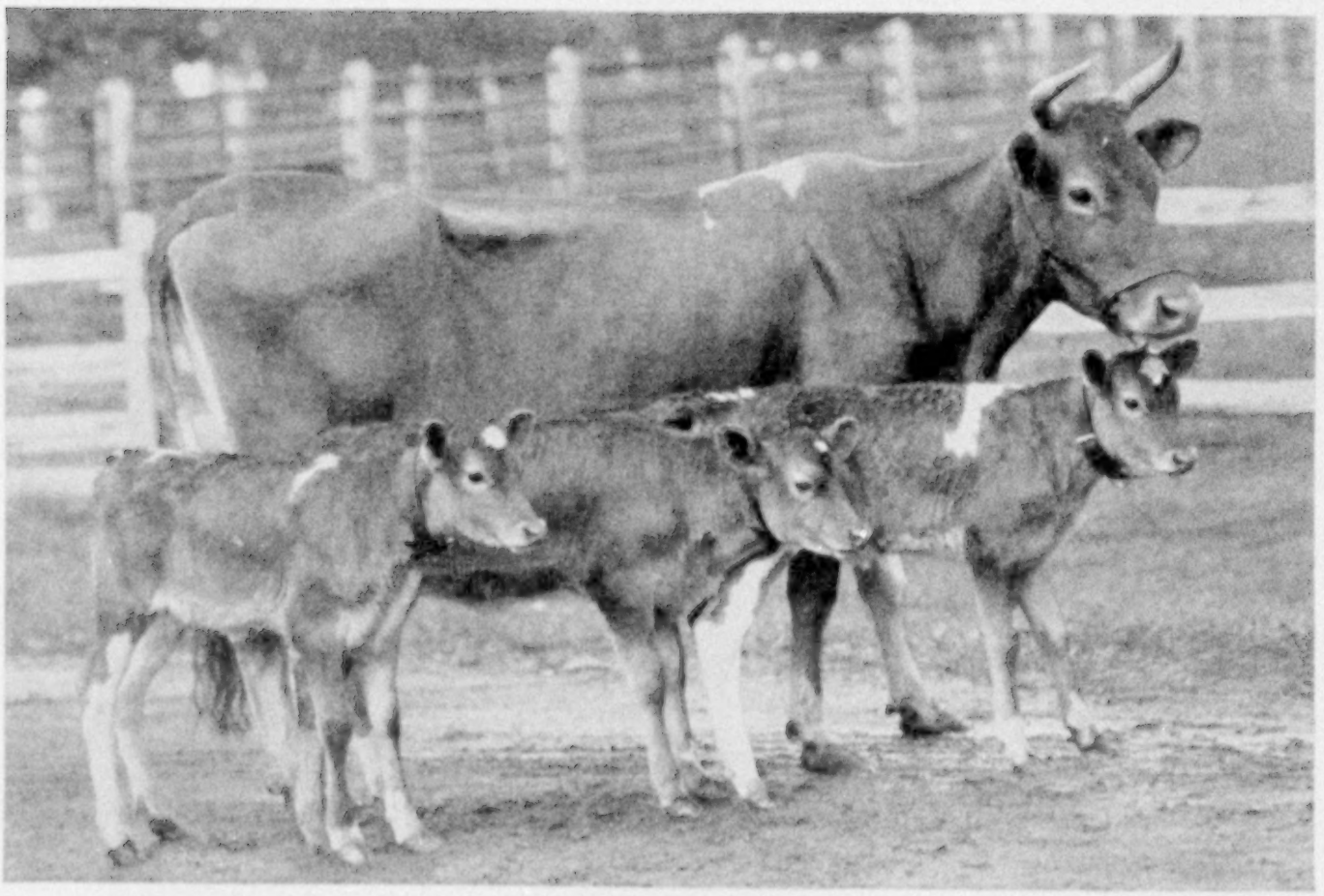
A subvariety of the Kerry, known as the Dexter, has attained considerable popularity, both in Ireland and in England. The exact origin of the Dexter is not clearly traced, but Professor Wilson, in his "Evolution of British Cattle," states that red cattle of North Devon type were taken to the south of Ireland a century or more ago and crossed with the native Kerry. He gives much credit to Devon influence and ascribes the red which occasionally occurs with Kerry and Dexter cattle to that source. He also states that the Devon transmitted the shortness of leg seen in the Dexter.

What was formerly the Kerry and Dexter Cattle Society of Ireland has recently changed its title to the Kerry Cattle Society of Ireland, and will no longer promote the Dexter. The Royal Dublin Society, the publisher of the Herd Book, has discontinued recording the Dexter. This is because of its alleged uncertainty in reproduction, the tendency of the cows, it is alleged, being to drop calves with "bulldog" heads.

Photograph from F. Hutchinson

A HOLSTEIN-FRIESIAN MOTHER AND HER QUADRUPLETS

This cow, owned by Mr. W. E. Lawson (at the right), of Manitoba Province, Canada, on July 2, 1925, gave birth to four healthy, normal calves.



© H. A. Strohmeyer, Jr.

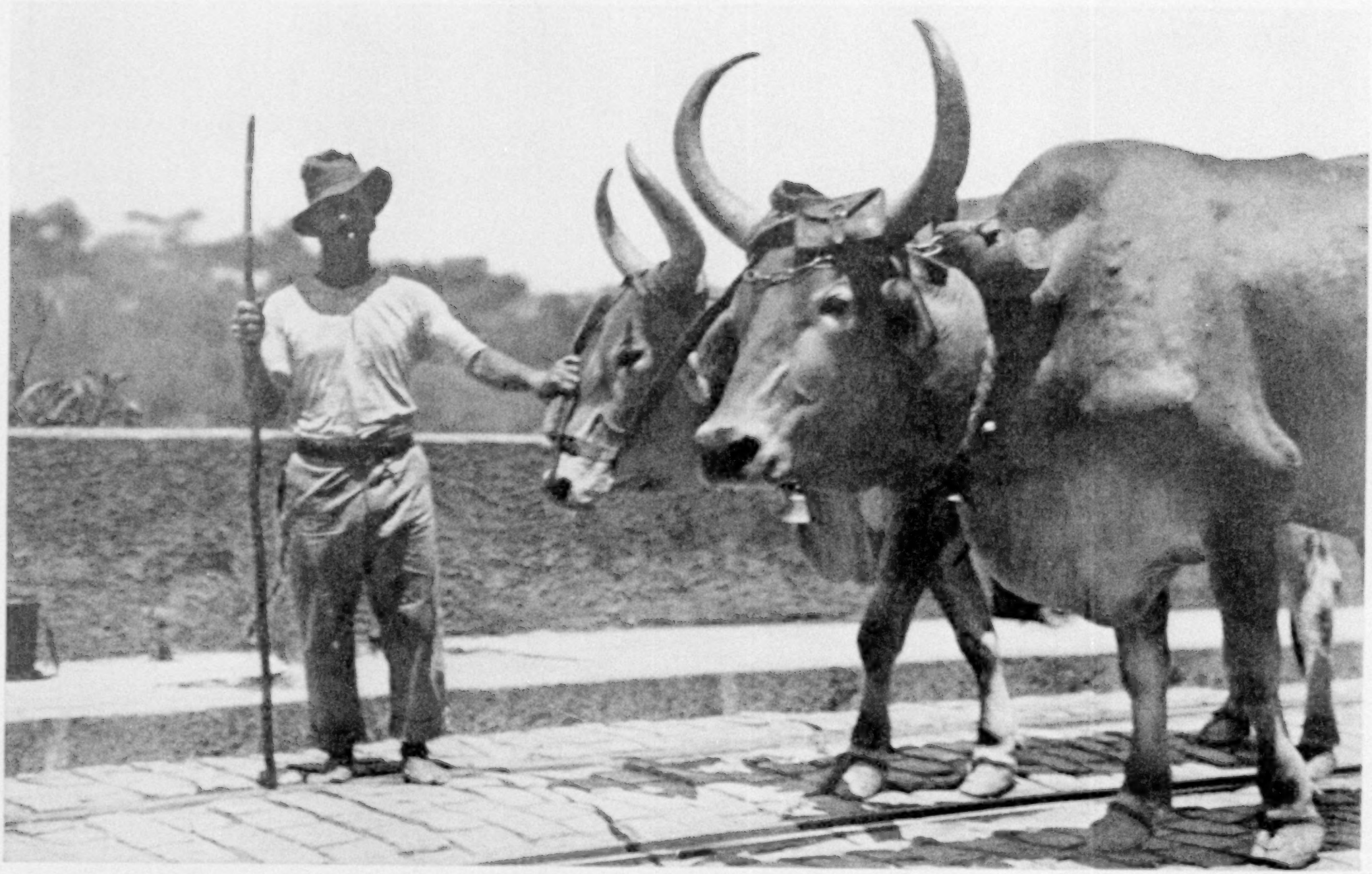
GUERNSEY TRIPLETS

Three-of-a-kind are not common among cattle, and these were the first triplet heifers to be registered by the American Guernsey Cattle Club.

Photograph by Charles Reid

SCIONS OF AN ANCIENT HOUSE

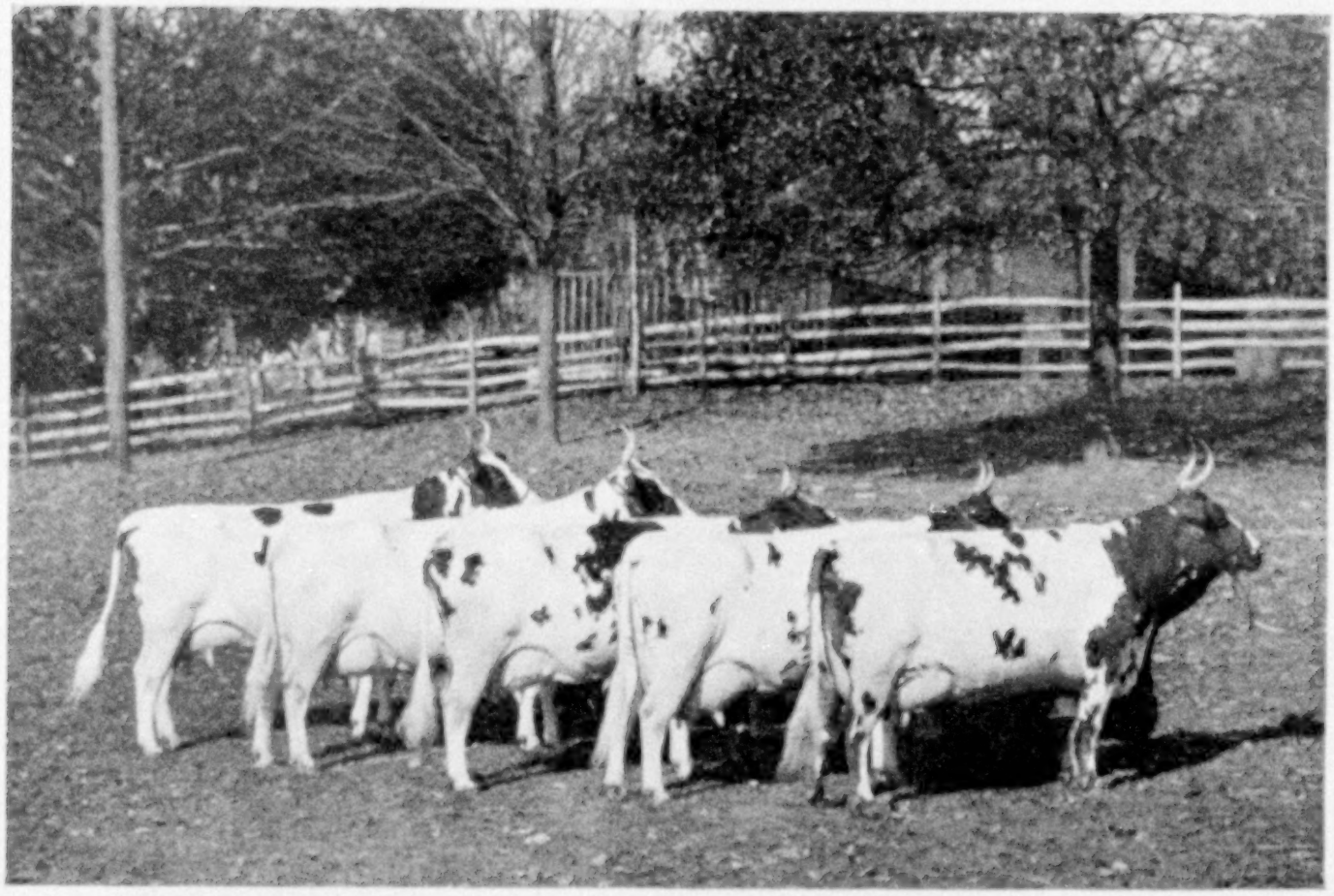
These Cadzow calves are examples of the so-called Wild White Cattle (see Color Plate VI), a few herds of which are still to be found in Great Britain. They are thought to be the nearest living connecting link to the prehistoric cattle of the British Isles and derive their name from Cadzow Castle Park, Lanarkshire, Scotland, in which their progenitors have roamed for several centuries.



Photograph by Harriet Chalmers Adams

BRAHMANS ON THE STREETS OF RIO DE JANEIRO

The sacred ox of India becomes a garbage carrier and jack of all work on the hills of Brazil's capital city. About 4 o'clock every afternoon all the oxen go down to the lower city, their work over for the day.



Photograph by H. A. Strohmeyer, Jr.

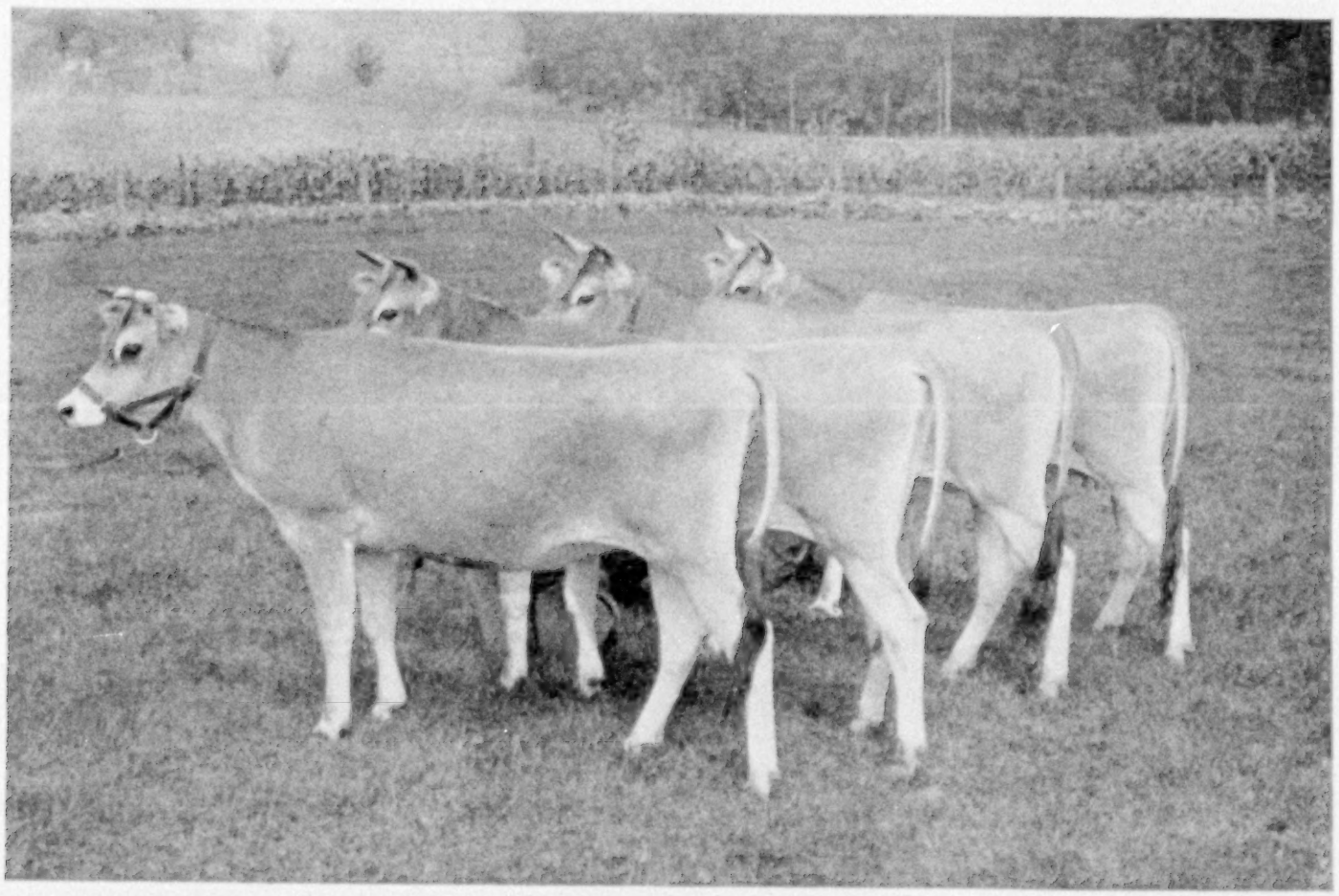
AYRSHIRE CHAMPIONS

This fine old Scottish dairy breed, while it has long been known in America, has of late years materially increased its popularity. The cows are noted for their splendid udders, strong, level quarters, deep bodies, and persistent flow of milk of the highest quality (see text, page 704).

Photograph by J. and J. Brown

A BELTED GALLOWAY BULL (SEE TEXT, PAGE 707)

An interesting offshoot of the shaggy-coated black polled Galloway breed of Scotland.



Photograph by H. A. Strohmeyer, Jr.

PRINCESSES OF JERSEY

A quartet of shapely heifers whose ancestors came from the Channel Island of Jersey.

The small size of the Dexter is also objectionable from the Kerry standpoint. It is either black or red in color and is more compactly built than the Kerry, having a round, plump body and very short legs.

Dexters are sought by some of their admirers because of their diminutive size. Some very handsome specimens have weighed only about 500 pounds, and one noted bull, known as La Mancha Union Jack, stood only 38 inches high and weighed 500 pounds. The late King Edward was especially interested in Dexters and maintained one of the good herds of the breed.

Interesting experiments in crossing Dexters with larger British breeds have been made, crosses with the Shorthorn, Red Polled Norfolk, and Aberdeen-Angus producing some remarkably fine butcher's beasts, some of which have been shown at the Smithfield (London) show.

A few specimens of both Kerries and Dexters have been imported into the United States and have attracted much attention as bovine novelties possessing practical utility. An American Kerry and Dexter Club was formed a few years ago, but the organization has been discontinued.

THE RED AFRICANDER

(*For illustration, see Color Plate XVII*)

South Africa is credited with having produced a type of cattle quite unsurpassed in point of splendid adaptation to its environment—the Red Africander breed.

There are now nearly 10,000,000 head of cattle of all sorts in the Union of South Africa, maintained chiefly in the eastern or Indian Ocean coast colonies lying between Rhodesia and Cape Town.

In the eastern Transvaal, the high-veld area of the Orange Free State, Natal, and the eastern parts of the Cape Colony proper, the Taurine population is chiefly centered. In those areas dairying is an important industry, and it is interesting to note that transplanted Friesians have there been brought to an exceptional degree of excellence, fine specimens of Cape breeding having been exported to England for breeding purposes and sold at very high prices.

While the Friesians and other dairy types have found a profitable field here, there are ranching possibilities in Rhodesia and the northern Transvaal, in which the native cattle, and especially the improved Red African type, are chiefly employed as foundation stock. Crossed with Sussex, Hereford, or Shorthorn bulls, they produce grazing beasts of superior character, finding a good market at Johannesburg and other centers.

The Red Africanders have existed as a distinct type for more than a century. They were developed by the early settlers from indigenous stock of unknown origin.

In the pre-railway days of South Africa the crying need of the colonies was for a good trek-ox for use in hauling the wagon trains that supplied necessary transportation—an animal that had activity, hardiness, speed at various paces, strength, docility, and intelligence.

The farmers of those early days rose to the occasion. The Africander ox, of uniform type

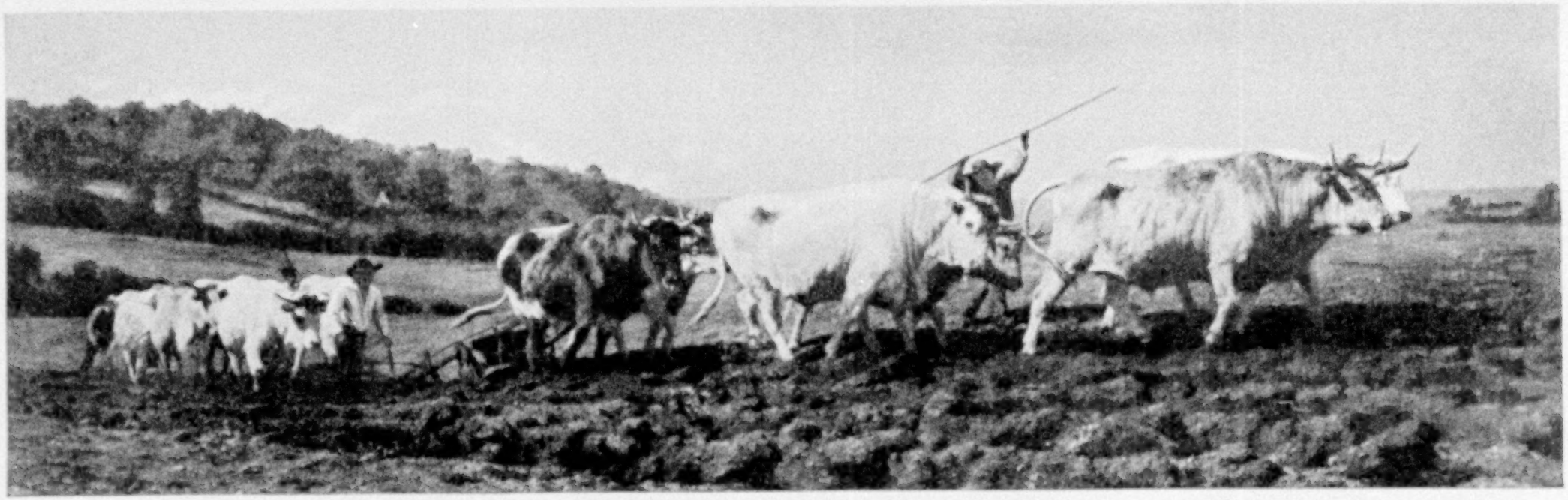
Photograph by Alice Schalek

AN OX TO THE RESCUE ON A MIRY ROAD IN CHOSEN (KOREA)

Photograph by Captain Frank Hurley

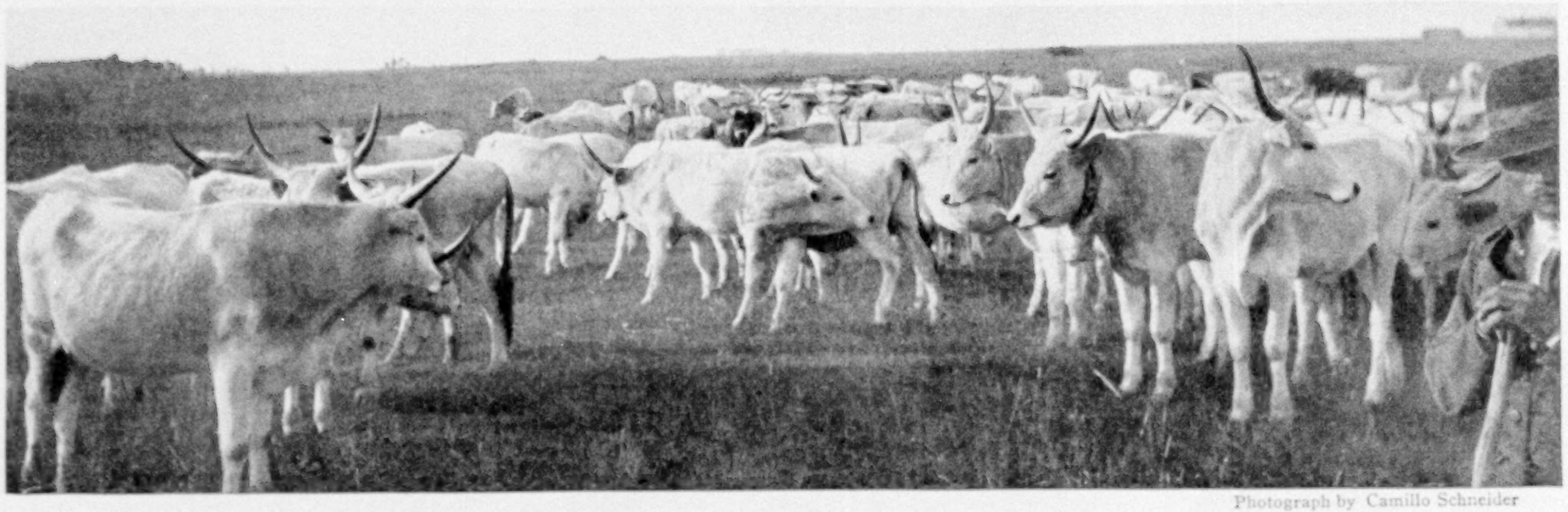
CATTLE OF THE SOUTH SEAS

Herds of British origin (Hereford and Shorthorn) grazing on a plantation in British New Guinea.



"PLOWING IN THE NIVERNAIS"

The original of this masterpiece hangs in the Luxembourg Gallery in Paris. It is one of the best works of the famous French animal painter, Rosa Bonheur.



Photograph by Camillo Schneider

CATTLE OF THE CENTRAL HUNGARIAN PLAIN

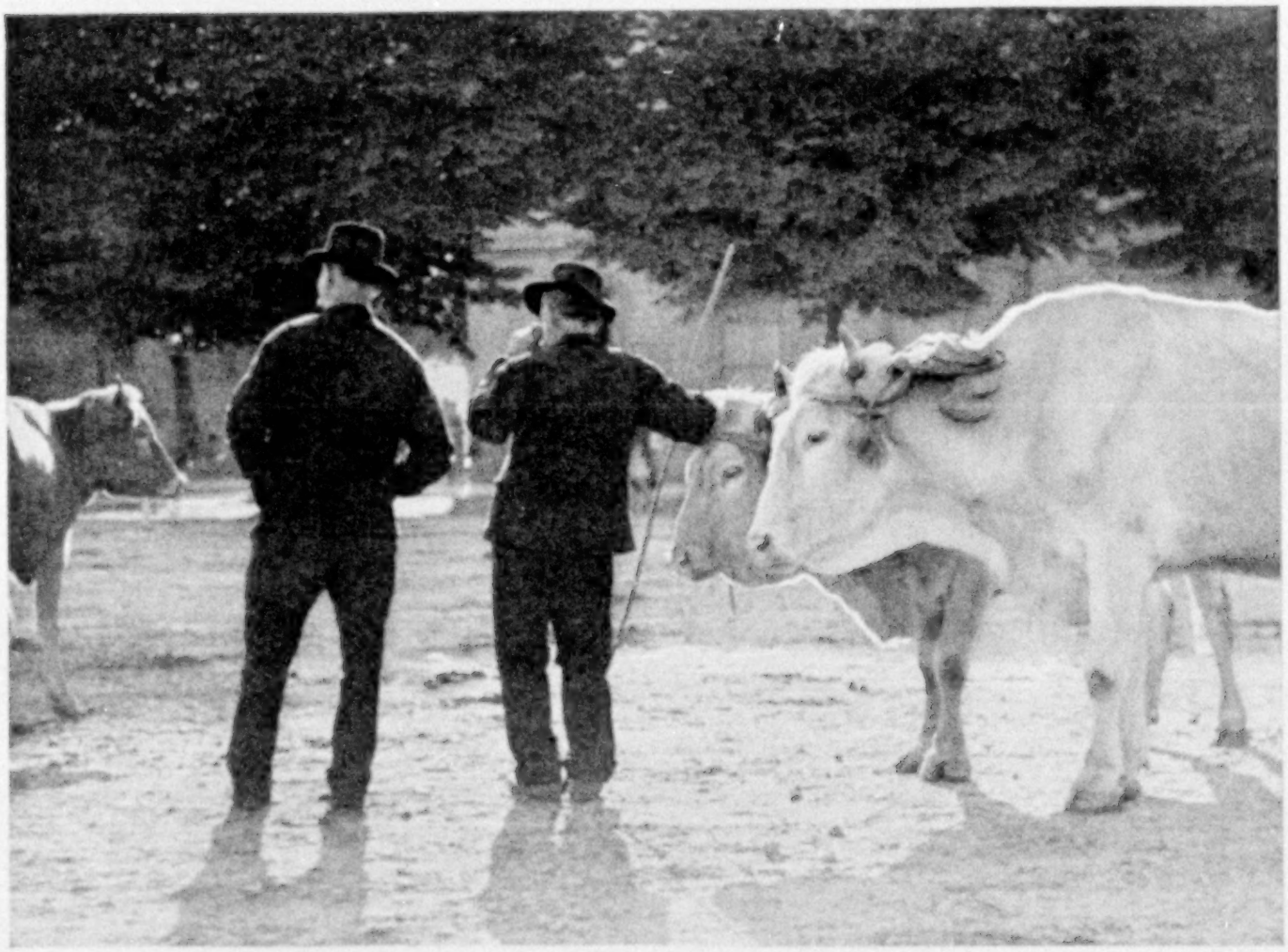
Because of poor flesh-forming and milk-yielding qualities, this type is giving way to less picturesque, but more useful, breeds.

MUSEUM

Photograph from Helmig and Company

SACRED COWS OF BALI

In the Dutch East Indies certain cows are regarded as sacred. One of the features of the annual New Year's Festival on the island of Bali is a race between these sacred animals. For this occasion they are bedecked with fanciful headdresses and enormous bells are hung about their necks.



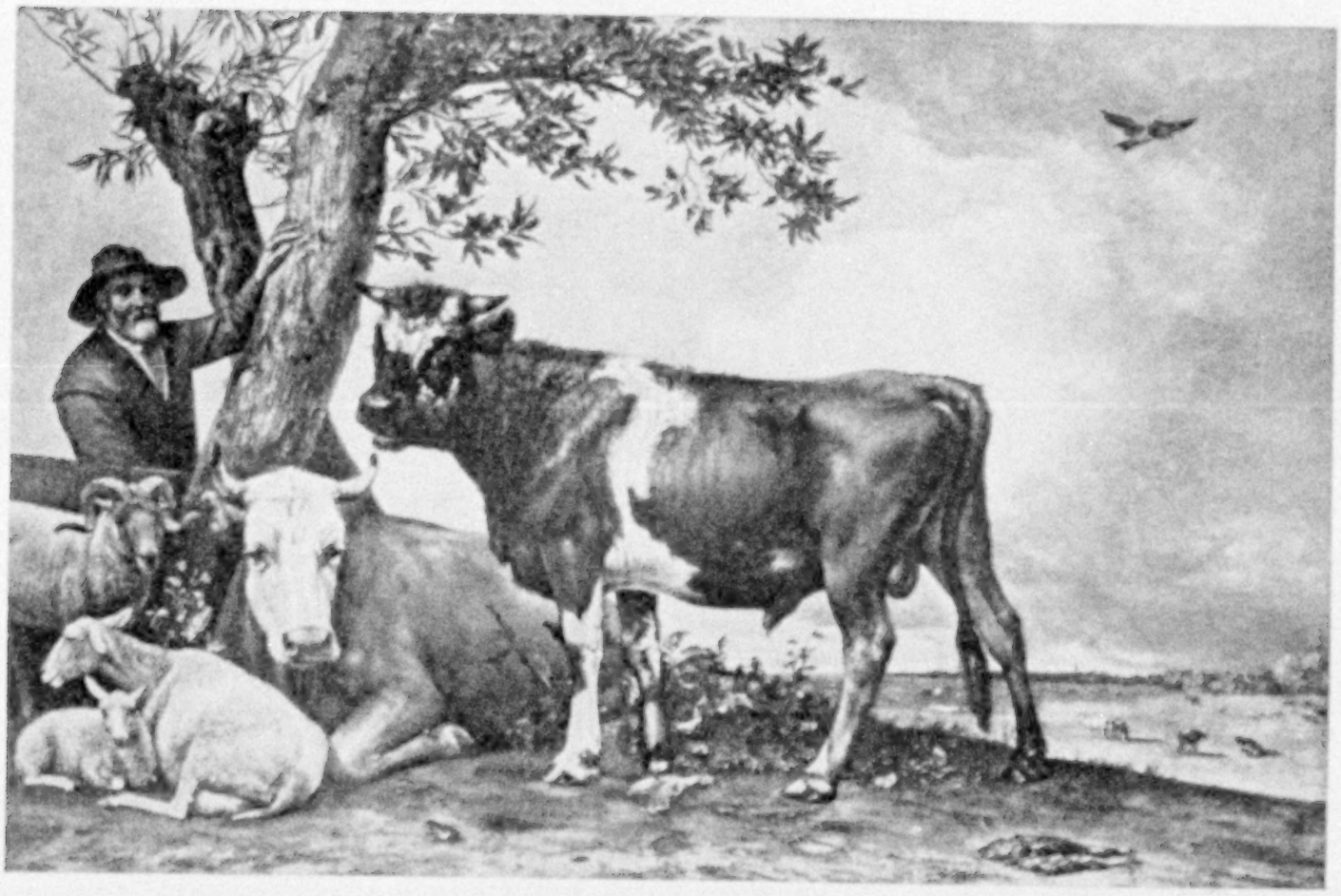
Photograph by M. O. Dell

WHITE OXEN OF LE PUY, FRANCE

Photograph by Charles Reid

THE COWS GIVE THE MILK AND THE BULL CARTS IT TO THE STATION

Everybody works, including father, in the herd in Scotland to which this Jersey bull belongs.



PAUL POTTER'S "YOUNG BULL"

This is one of the most famous cattle pictures in the art museums of Europe. It hangs in the Gallery of The Hague (see text, under "Minor Dutch Types," page 664).

and color, met not only the requirements of the trails, but the demand for draft purposes in the fields. When the yoke-worn bullock was finally turned out upon the native grasses of the veld, he completed his service to his creators by fattening himself into good, edible beef.

A king Africander bull has not many superiors in impressive character among the improved breeds of other lands. Fully matured bullocks grown under veld conditions—that is, without shelter or food other than the natural grasses—weigh from 1,200 to 1,400 pounds. They naturally resist drouths, ticks, and other insects, as well as disease, better than imported breeds, and afford a basis for grazing operations even better than the Longhorn that made our own Western cattle ranching possible.

The voor-trekkers (early pioneers) who developed the Red Africander breed are entitled to rank with the bovine breed-builders of the Northern Hemisphere.

THE AYRSHIRES

(*For illustration, see Color Plate XVIII*)

A notable modern instance of rare constructive skill in manipulating bovine form and characteristics to suit a local environment is afforded by the case of the Ayrshire, the only breed of special dairy character originated in the British Isles. It was developed by the thrifty farmers of the Ayrshire district of southwestern Scotland, first by crossing a native stock with other breeds, and later by carefully considered selective mating.

Most authorities have credited the old Teeswater stock as the most likely beginning of improvement, but infusions of various other bloods are also suggested as probable, including Wild Whites, Highland, and Channel Island crossing. The foundations of the now well-established race are thought to have been laid between 1750 and 1780.

The Ayrshire farms along the banks o' Doon and the gurgling Ayr, as well as on the hills that lead up to the highlands of southern Lanarkshire and North Dumfries, are small and the herds are close together. The country folk are neighborly and "each yin kens the ither's business." Consequently when one has something unusually "guid" the neighbors are certain to find it out.

So, in developing and perfecting the Ayrshire, when a certain sire begot better calves than those found in neighboring herds, his sons were readily salable to those who sought the improvement noted. Moreover, Scotch thriftiness led to the heavy use in service of any bull which proved himself a good breeder.

In this way full advantage was taken whenever an animal of extra transmitting qualities was produced, so that the breed was benefited in the largest way.

The Ayrshire was developed to fill a certain definite want. A dairy cow was needed, and the breeds already in existence were not adapted to the climatic and feeding conditions of Scot-

Photograph by Emil P. Albrecht

A TEAM IN THE PYRENÉES

Among the mountains of southern France both ox and cow teams are in general use. Sometimes the yoke is fastened to the animals' necks, but more often it is bound to their horns and topped with an imposing-looking headdress of shaggy goatskin, which gives a very decorative effect.

land, where the development of root crops and a progressive agriculture made necessary the use of dairy animals.

Although other breeds had been tried and in some instances proved useful in the low, fertile valleys, yet none had been satisfactory on the hill farms in competition with the native stock said to have served as the foundation of the breed now called Ayrshire. A few men, therefore, set themselves the task of breeding an animal with the constitution and healthy vigor to withstand rigorous treatment by the elements and at the same time make an economic return for the rather scanty rations supplied.

The success of these Scotch breeders in their search for a dairy cow is attested by the popularity of the Ayrshire in Scotland and England to-day, to which special emphasis was given at the 1923 London Dairy Show, where Ayrshires defeated the representatives of all other breeds, both in the showring and in the interbreed milking contests.

Exportations have been made to many countries, and the breed has made good, under widely varying climatic conditions, from the Tropics to the Arctic, and in every longitude, from Sweden and Finland to South Africa and Australia; from Canada to Porto Rico and Mexico and Central America.

The first Ayrshires to reach America were imported into Canada more than 100 years ago. They were brought from Scotland because of their ability to withstand the rigors of an ocean voyage in those days and because of the excellence of their milk. While some Ayrshires are supposed to have reached Connecticut as early as 1822, the first definite record of importation is that of the Massachusetts Society

Photograph from Samuel G. Gordon

LOADING CATTLE AT SALAVERRY, PERU

Along the west coast of South America, where large ocean-going freighters cannot come close to the shore, cattle are loaded into open boats and towed out to deep water, where a derrick hoists them on board by means of a belt slung under them from front legs to hind quarters.

for the Promotion of Agriculture, in 1837. Importations in conservative numbers have been made with fair regularity since, the average for the last two decades being about 200 head per year.

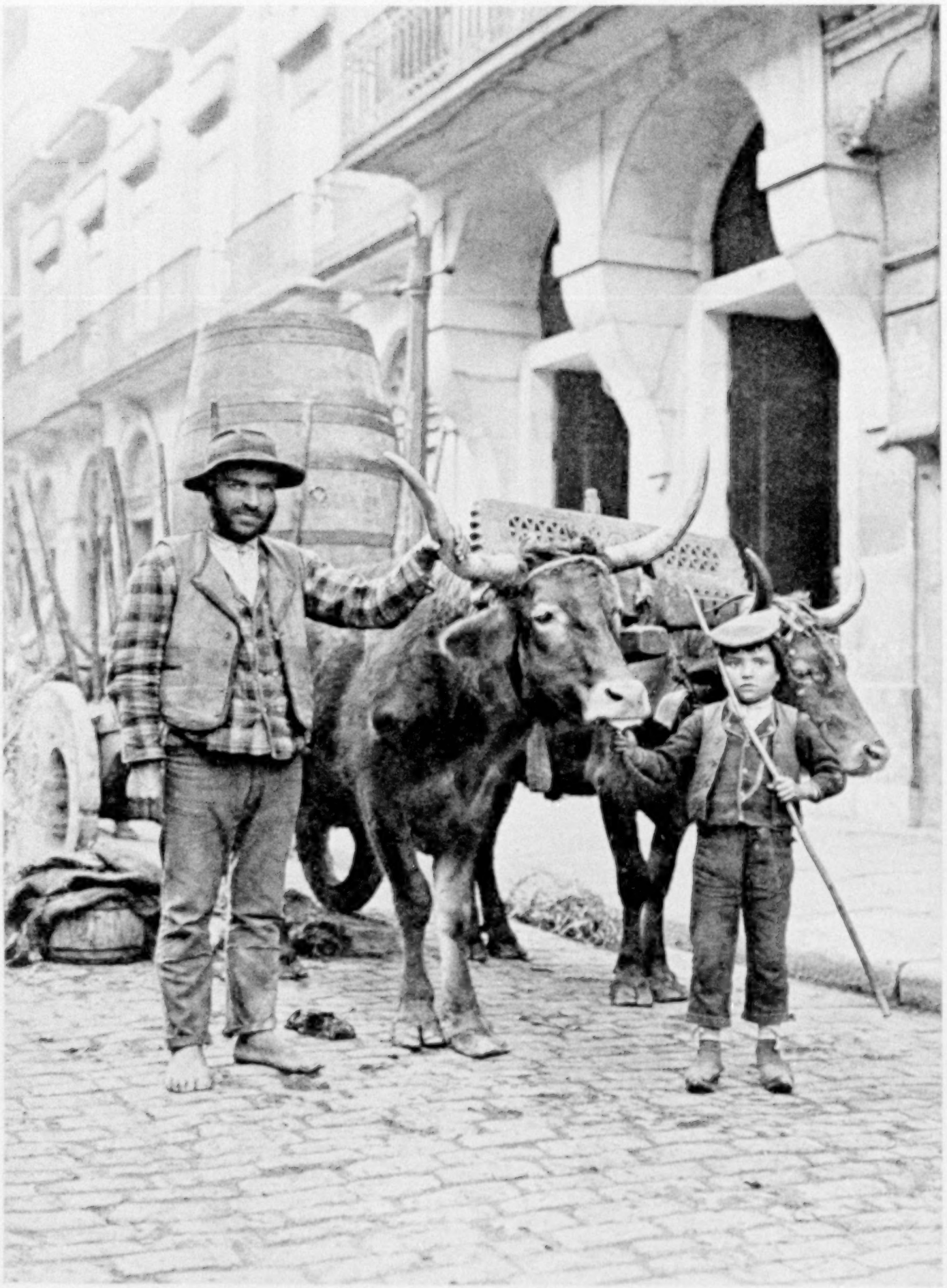
The story of the Ayrshire's qualities early spread throughout the northeastern part of the United States. Accustomed to gaining a livelihood on the Scottish hills, it readily adapted itself to conditions in New England, which is to this day a stronghold for the breed.

More than a half century ago New York farmers, learning of the hardiness and profitableness of the Ayrshire stock to the eastward and in Canada, established herds, and that State now leads in the number of cattle of this breed, having nearly one-third of all in the country within its borders.

Pennsylvania has awakened to the breed's merits and has founded many splendid herds, while in the Middle West and on the Pacific coast, wherever dairying is developing, there is an increasing demand for breeding stock. Today Ayrshire herds may be found upon the hillsides of every State in the Union.

In 1923 a total of 7,077 American Ayrshires were purchased by breeders in 43 States, the Virgin Islands, Canada, Central America, and China. There are now registered in the Herd Books of the Ayrshire Breeders' Association, the record organization of the breed formed in 1875, a total of 113,467 Ayrshires, of which 82,980 are females.

An important factor in increasing the popularity of Ayrshires in the United States is the development of Advanced Registry testing. A



Photograph by A. W. Cutler

AN OX CART IN OPORTO, PORTUGAL, WITH A LOAD OF PORT WINE

Note the ornate carved yoke, which probably has been handed down from father to son for generations—a prized heirloom.

© Donald McLeish

DUTCH LANDMARKS

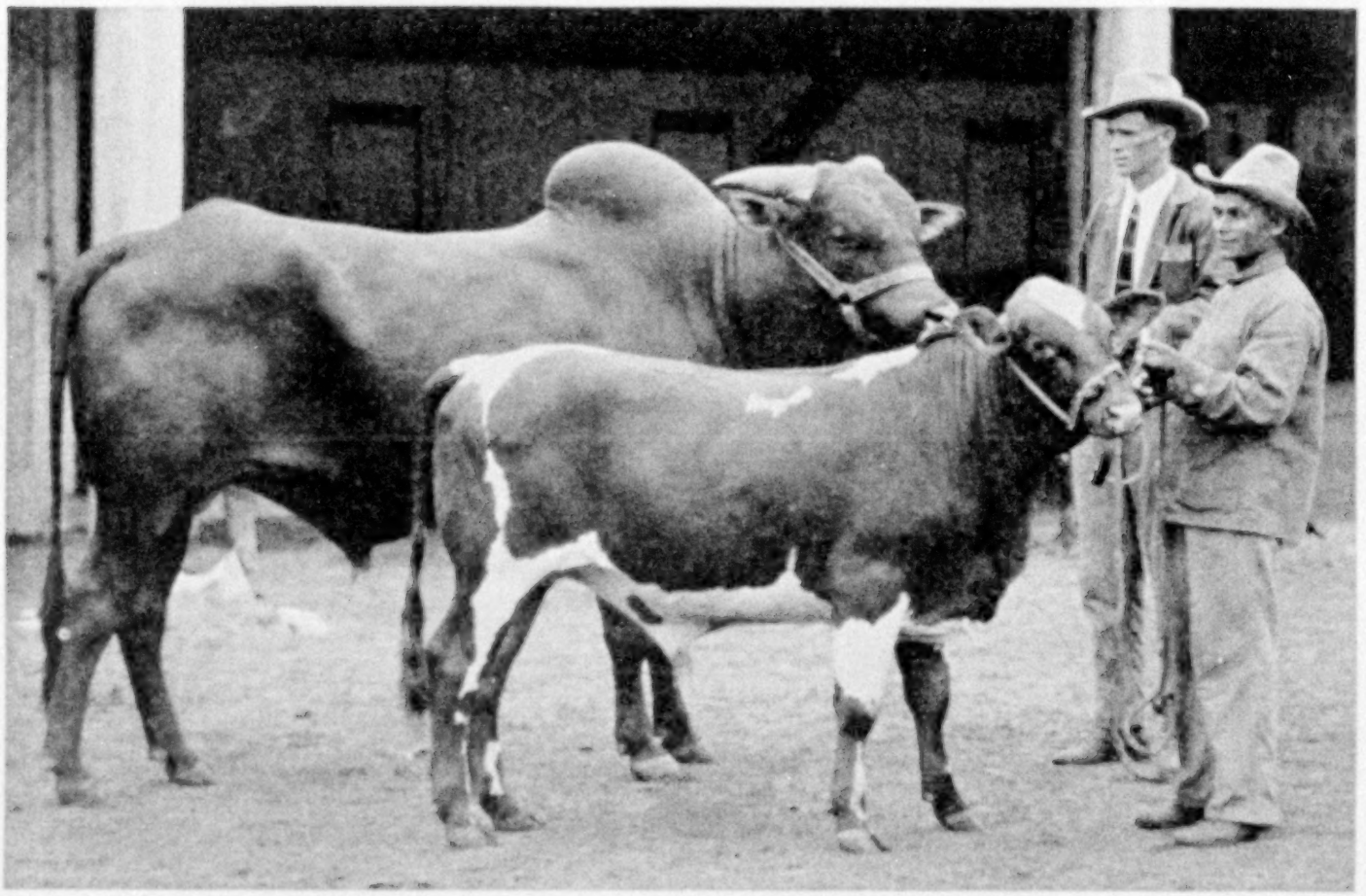
The windmill and the black-and-white cattle are almost equally characteristic of the Dutch countryside. The former is used for draining pastures for the latter to graze in, and the two, combined with the cleanliness and thrift of the people, have placed the Netherlands high in the ranks of the dairy nations.

number of highly creditable yearly productions have drawn the attention of dairy farmers to the fact that the type of the Ayrshire carries productive ability to a high degree. The highest of these records is that made by Garclaugh May Mischief, of 25,329 pounds of milk and 894.91 pounds of fat. This cow, the champion of the breed, is still milking profitably and reproducing regularly at Penshurst Farm, in Pennsylvania, at 18 years of age.

Records have proved the longevity of the breed and its long-continued productiveness, a number of 10,000-pound productions being recorded for cows more than 20 years of age.

The special pride of the breed lies, however, in its averages rather than in individual production. In the past two years 1,353 records, more than 50 per cent of them made by immature animals and a number by those well past the age at which most dairy cows cease to be profitable, averaged 11,038 pounds of 4 per cent milk, the exact fat average being 441.44 pounds.

The uniform productive capacity of the breed inclines the owners of Ayrshires to favor the Scottish system of milk records, which provides for testing all cows in a herd rather than a selected few, as is frequently the practice in the United States. Consequently they are entering coöperative cow-testing associations and setting high records with sufficient frequency to estab-



Photograph by Smith and Morton

A BRAHMAN BULL AND HIS SHORTHORN OFFSPRING

Both the hump and horns present in the father are absent in the son, whose mother was a registered Polled Shorthorn. Brahmans have been introduced into the American Southwest because of their ability to withstand heat and drought and their immunity from the attacks of the cattle tick.

lish the Ayrshire's claim to marked uniformity in a heavy flow of 4 per cent milk.

Ayrshire cows weigh about 1,000 pounds and the bulls from 1,400 to 2,000 pounds. The color is white and red and brownish-red verging on the mahogany. The typical New England Ayrshire is red, with only a little white, but the more popular color in other sections, particularly with show-yard individuals, is white, with only a little red about the head and neck and a few spots scattered over the body.

The question of color is given relatively slight consideration when the animal is above the average in other respects. The horn is characteristic, being long and curving outward, upward, and slightly backward. The top line is very strong, the rib deep, the chest full, the barrel large, and the legs straight and strong. Ayrshire enthusiasts maintain that this breed's udder is the most nearly perfect of any cattle, being attached high behind and well forward and having a flat sole, with the teats of medium size and well placed. Ayrshires are prepotent, commonly breeding true to form. There is no lover of perfection in animal form who is not strongly attracted by the lines, the vigor and character, and the perfection of udder of the Ayrshire.

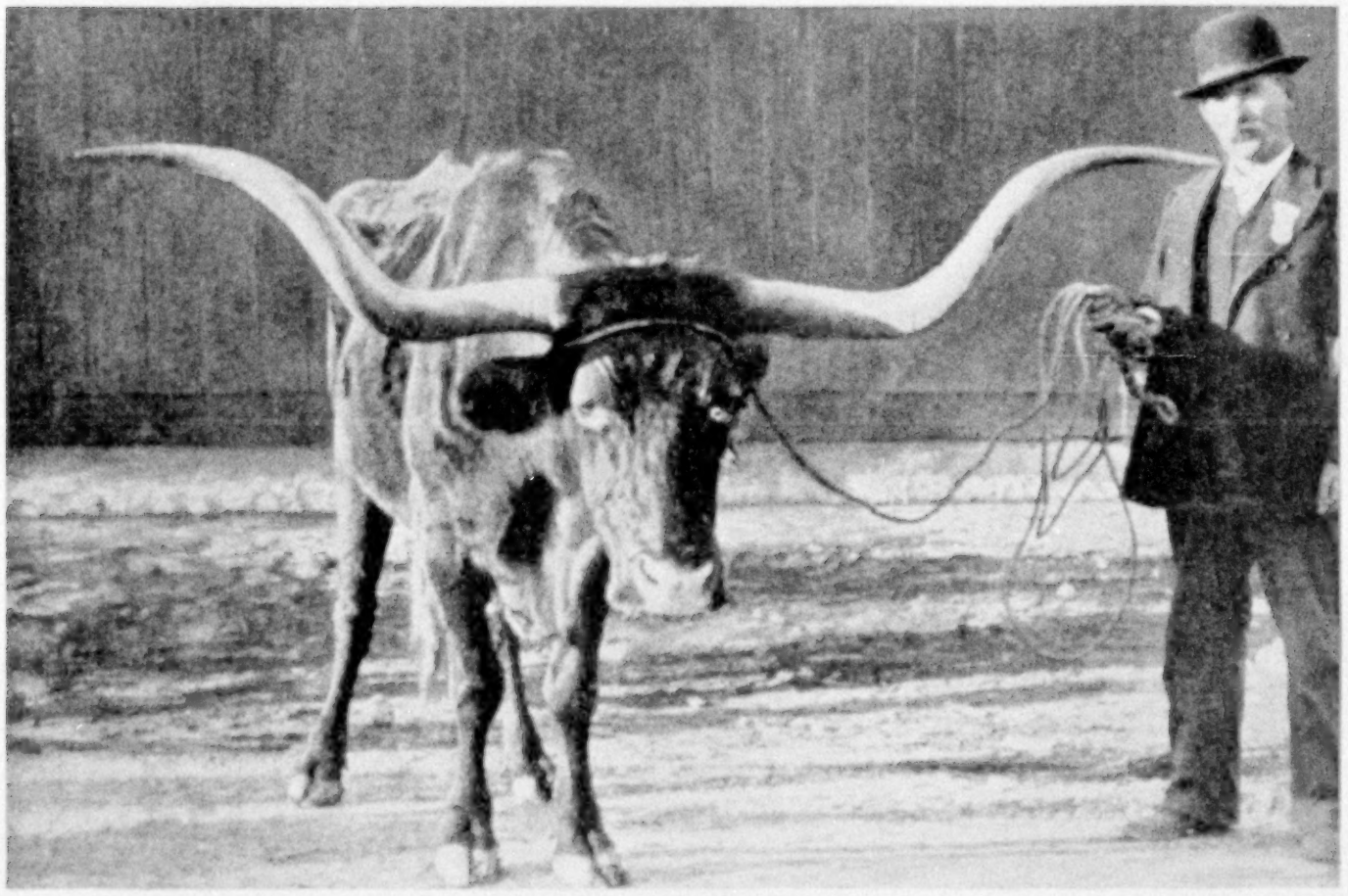
The Ayrshire is notably long-lived. She matures a little slowly, being frequently at her best at ten or eleven years, and continues useful to a great age. She is hardy, vigorous, and disease-resistant. She is an excellent grazer and makes economical use of the feeds she consumes. Her calves are healthy and strong at birth and easily raised. Her milk is of the highest quality, testing 4 per cent in fat, the globules very small, and it is so well balanced in its nutrients that the breed is not only a favorite with market-milk venders, but popular in certified dairies and others where quality is emphasized. Ayrshire milk is in special favor with physicians and dietitians.

ABERDEEN-ANGUS

(For illustration, see Color Plate XIX)

Notable among the breeds of cattle for beef production is the Aberdeen-Angus. Its native home is in eastern Scotland, north of latitude 56°, where the three counties of Aberdeen, Kincardine, and Forfar line up in bold face against the North Sea. This land of hill and dale has a rugged climate, with a touch of Scotch mist from the sea. It is a fine country for growing small cereals, potatoes, turnips, and beets, while extensive pastures furnish rich grazing for farm animals.

Here for many generations have lived and prospered a thrifty farmer folk who specialize in breeding cattle. In southern Aberdeen, in the Buchan district, the breed was known as "Buchan humlies." In the Angus section of



Photograph by Texas Farm and Ranch Company

OLD GERONIMO (SEE TEXT, PAGE 710)

This old warrior of the Southwest is reminiscent of "Buffalo Bill" and his Wild West Shows and was one of the last of the real "Texas Longhorns." His very name calls up visions of a famous old Indian chieftain. At the time this picture was made, in 1899, the steer was supposed to have been 36 years old.

Forfar they were "Angus doddies." Various words were used by the Scotch, such as "humlies," "doddies," "dodded," etc., to indicate that they were polled or hornless.

In America the word "polled" is universally used as applied to cattle that are naturally hornless. While Aberdeen-Angus is the correct name of this breed, whether in Scotland or in America, in its adopted home, the name "Polled Angus" is in common usage.

The origin of this breed has been the subject of much speculation. Some have expressed the opinion that these polled cattle originated as sports from black cattle with horns. Others have thought them descended from hornless prehistoric stock, and that they may be of Scandinavian ancestry introduced into Britain by the Norsemen, for hornless cattle have a long record in Norway and Sweden. Professor James Wilson assumes that they are not descended from sports, but come from the same race of hornless stock and are presumably of Scandinavian origin.

Historically, polled cattle have been a matter of record in Scotland only since 1752, when a Mr. Graham entered in an account book the purchase of "one humble oax." The first printed reference to hornless cattle in Angus is dated 1797 in the old Statistical Account of the parish of Bendochy, which states that "there are 1,229 cattle in the parish, many of them dodded, wanting horns." Documentary evidence of polled cattle in Aberdeen is said to date back to 1523.

The first noteworthy improvement of the black polled cattle of this section of Scotland began with Hugh Watson, of Keillor, Forfarshire, who was born in 1789 and died in 1865. He was a great constructive breeder and produced an earlier-maturing, heavier-fleshed, thicker type that dressed out at slaughter to produce more and better meat than had heretofore been known.

Among the remarkable cows owned by Watson was Old Grannie. In the 36 years of her life she had 25 calves—one of the most wonderful records for longevity and fecundity in the bovine world.

One of the greatest cattle breeders of all time, William McCombie, of Tillyfour, Aberdeenshire, began with the "doddies" shortly after Watson took them up, and did more to make their merits known than any other early improver of the type. He developed the famous Pride of Aberdeen and other celebrated families; carried the Aberdeen-Angus colors to world's championships at the Paris Universal Exposition, and was the producer of the far-famed bullock Black Prince, that brought his breeder signal honors from the late Queen Victoria.

Some of the more characteristic features of

Wide World Photograph

CAUGHT OFF HIS GUARD IN THE PLAZA DE TOROS, MADRID

This Spanish bullfighter had been advancing from the side when the animal made a sudden turn, catching him with one horn. By good fortune the toreador made his escape with only minor injuries.

the Aberdeen-Angus are the black color, hornless and comparatively short head, compact, low-set body, fine quality of flesh, and high percentage of marketable carcass to offal in killing. While black is the almost universal color, occasionally red sports occur, an inheritance from early days, when these cattle were red as well as black. Red animals of the breed, however, are not permissible of record in the Herd Books of to-day.

The head of the Aberdeen-Angus is short, broad of muzzle, prominent of eye, with the poll, or top skull, neatly pointed, and is representative of what stockmen designate as a "feeder's head." Good examples of the breed are highly developed in back and quarters, where the high-priced cuts of meat are found, while the neck and leg, which furnish the cheaper cuts, are comparatively short.

At maturity these are heavy-weighing cattle in proportion to their size, although they weigh slightly less than the Shorthorn and Hereford, notwithstanding the fact that some animals of the breed have attained notably heavy weights.

Scarcely more than a half century ago Aberdeen-Angus cattle were first imported to America by George Grant, of Victoria, Kansas, yet in this time they have attained more high honors in competition on the butcher's block than any other breed. Their great record in America begins with the first show of the International Live Stock Exposition in 1900.

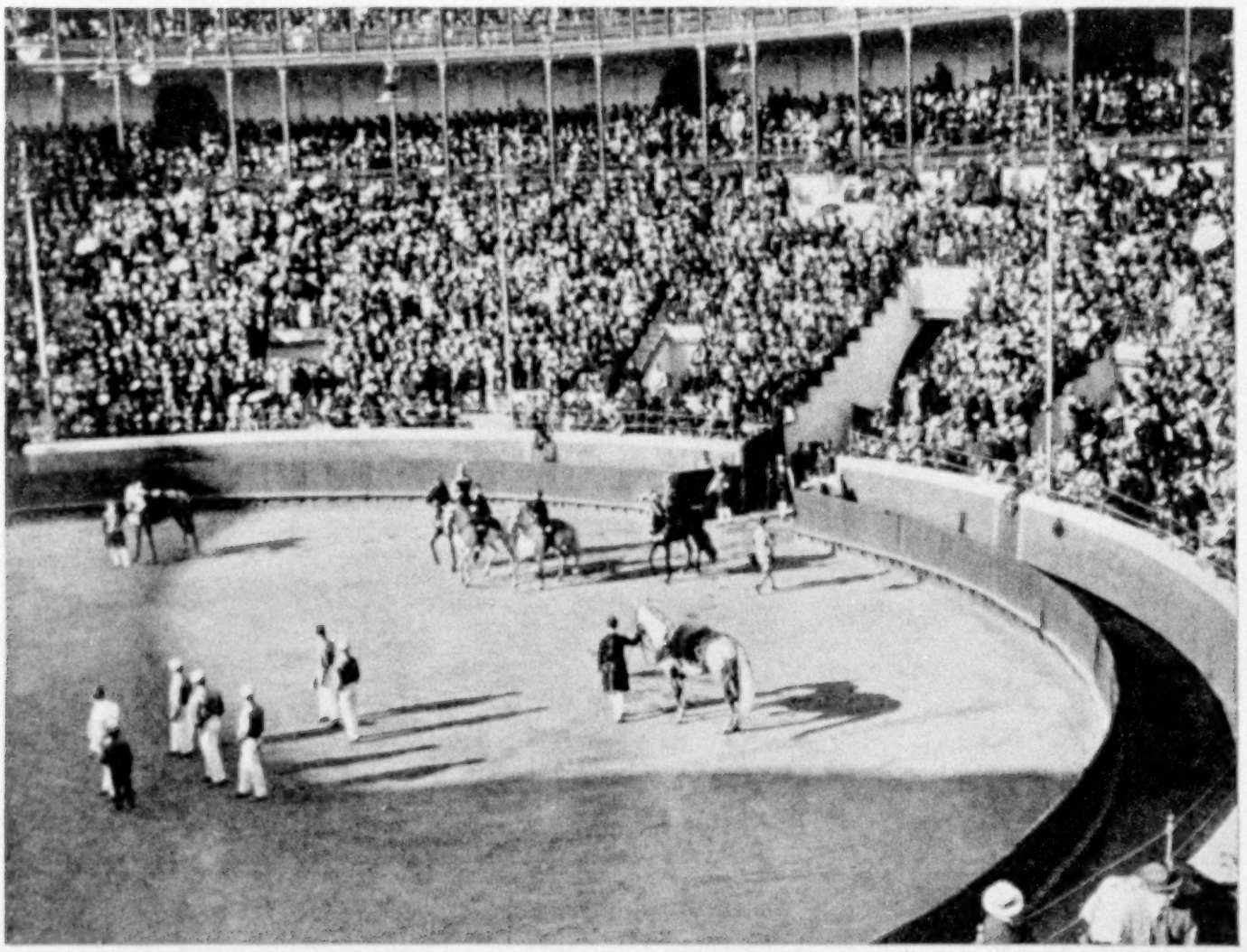
Since then 22 grand championships on single steers have been awarded at the International, of which 13 have been won by Aberdeen-Angus purebreds or grades. In the annual competition of carloads of fat cattle at the International since 1900, out of 23 grand championship awards the Aberdeen-Angus has won 19—a remarkable record.

In the British competitions similar results have obtained. Carlots were slaughtered, and found special favor among the butchers because of the small percentage of offal to merchantable carcass and the superior quality of the flesh, without heavy external layers of fat. Buyers pay the highest prices for these cattle, as well-fattened steers of the breed may be expected to dress out 65 per cent or better of carcass to offal.

Prime Aberdeen-Angus bullocks are generally recognized as the best of all "killers," so far as the production of rich, thick-cutting, finely-marbled flesh is concerned. The fat is evenly distributed throughout the entire carcass.

The crossing of the Aberdeen-Angus with horned cattle, as a rule, results in polled progeny that kill to furnish carcass superior to the horned parent. This hornless cross is also highly valued, as polled cattle suffer no injury from horns and feed together more quietly and in closer quarters than do cattle with horns.

The Aberdeen-Angus Cattle Society in Scotland and the American Aberdeen-Angus Breed-



Photograph by Franklin L. Fisher

THE ENTRANCE OF THE BULLFIGHTERS: LISBON

In Portugal bullfighting is a sport of skill shorn of much of the brutality which marks the contests in Spain. The horses are not gored and the bull is not killed, but after the toreador has successfully implanted a certain number of banderillas in the animal's back it is pronounced "dead" by the judges and is then driven from the arena.

ers' Association promote the breed in Britain and on this side, engage in registration of pure-bred animals, and publish Herd Books. In the American register 388,594 animals have been recorded. Quite a number of boys' and girls' calf clubs in the Middle West are promoting this black polled breed (see illustration, page 687).

The Aberdeen-Angus does not have so wide a world distribution as the Shorthorn or Hereford, but it is steadily growing in popularity in the land of its nativity, in England, Canada, and the United States.

THE GALLOWAYS

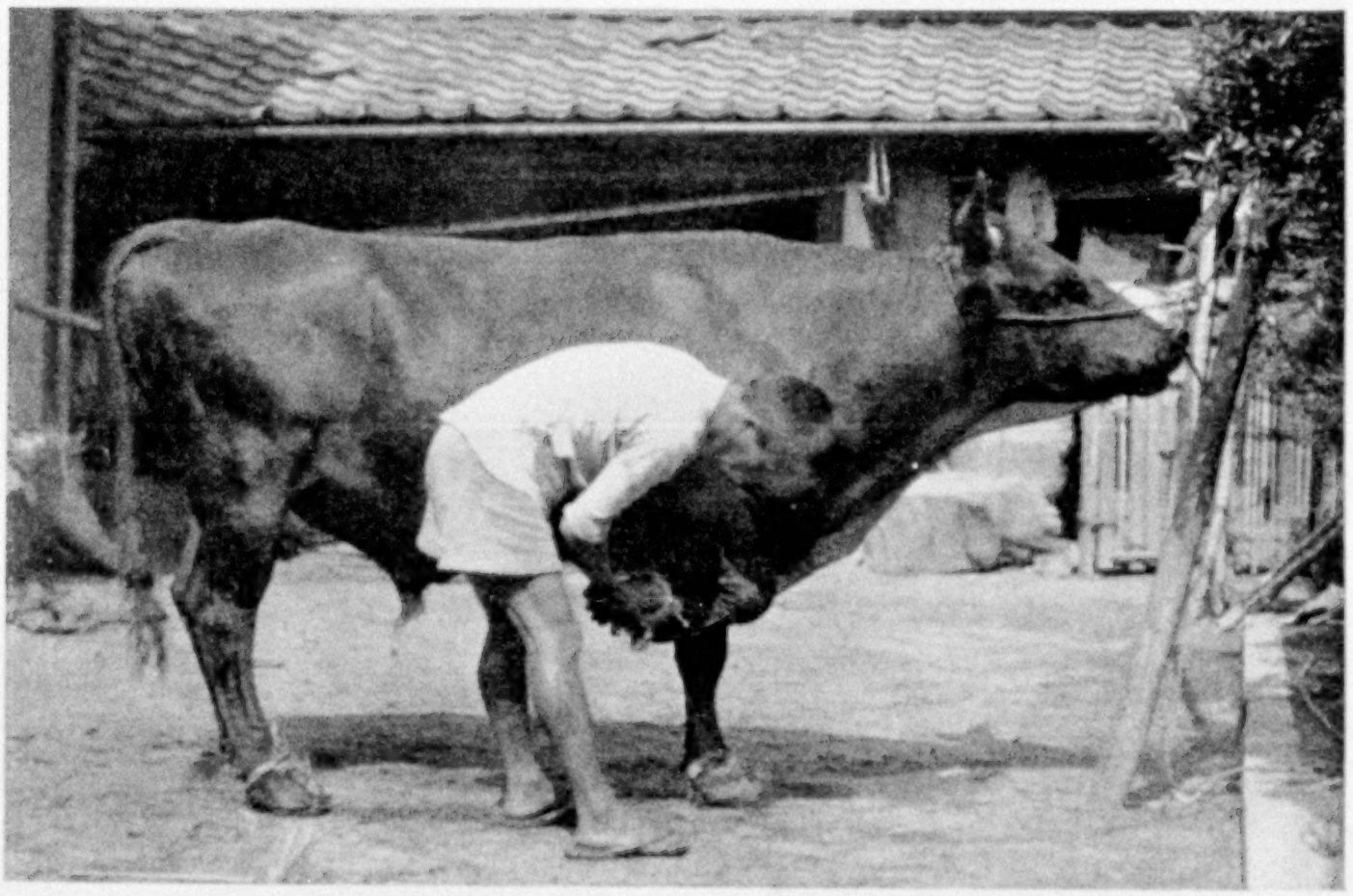
A first cousin of the Aberdeen-Angus is the Galloway, native to the district of that name in extreme southwestern Scotland, which to-day includes the old shires of Wigtown and Kirkcudbright.

The present-day area of Galloway, some 40 by 90 miles, with a sea front on the south and west, has a variable surface of wide moors, rough hills, and heather-topped mountains. The climate is damp and cloudy much of the time, cold and inclement in winter and often cool in summer. Much of the land is well suited to grass, and cattle graze upon the pastures through most of the year.

The origin of the Galloway is involved in the same obscurity which attaches to the Aberdeen-Angus. Developed in a region where horns were not uncommon, breeders by selection have gradually established the polled type. About 1789 George Culley wrote of "polled or humbled" cattle, and stated that "for the original of these we must look in Galloway."

English cattle buyers early showed a preference for polled varieties, and "by the end of the eighteenth century as many as 20,000 head of cattle were driven from Galloway to the English markets."

In hornless character, color, and general form the Galloway and Aberdeen-Angus bear a close resemblance. As a rule, however, the Galloway is not so wide of back and deep of body; neither does it fatten so easily as the Aberdeen-Angus, although it produces a superior carcass. These cattle are extremely hardy, and have made a fine record in this regard at the Alaska Experiment Station at Sitka, where they have been bred for a number of years.



Photograph by Kiyoshi Sakamoto

A JAPANESE "OX COBBLER"

In the Island Empire of the Far East the oxen wear straw sandals to protect their hoofs.

A striking feature of the breed is the wonderful coat of long, black or brown-black, silky hair that is in its most attractive condition during the early winter season. It consists of two parts, a soft, silky, close undercovering and a long, soft, moderately curly outer coat. This heavy coat of hair affords the animal protection from storms in winter, suiting them especially for exposure on the open range (see page 692).

Well-tanned Galloway hides, with the thick, long fall or winter coat of hair, make unsurpassed robes, floor rugs, or overcoats and sell for high prices.

The carcass of the Galloway meets a high-quality market demand because of its fine grain and moderate covering of white fat. Although introduced here many years ago, these cattle have not played much of a part in the American market because of the small number of herds.

For many years, in northern England and southwest Scotland, cattlemen have been producing what are known as "blue-gray" cattle for the butcher, the result of crossing Galloways and white Shorthorns. Such a cross produces an unsurpassed and extremely popular carcass.

An interesting variation from a typical example of this breed is found in a very limited way in Scotland, and is known as the Belted Galloway. These cattle have the same general characteristics as the ordinary Galloway, except for a band of white encircling the body between hips and shoulders. They are also regarded as superior milkers.

A leading Scotch breeder writes that belted cattle have been bred in Galloway from time immemorial, but until recently only two breeders in Scotland and two in England have attempted to breed them with the view of perpetuating this belted character.

Organized effort in promoting Galloway cattle first took place in 1862 in Scotland, when the Polled Herd Book was started, in which were included both Galloway and Aberdeen-Angus in the first four volumes. In 1877 an independent Galloway Cattle Society was formed, which has been in existence ever since and which has published many volumes of Herd Books. An American Galloway Cattle Breeders' Association was organized in 1882 and supervises the breed welfare in this country. In its Herd Book are registered 49,440 animals.

THE TEXAS LONGHORN

(For illustration, see Color Plate XX)

This picturesque type, once so familiar on our Southwestern ranges, is of Spanish origin and is now extinct, so far as our present range-cattle business is concerned. When the first Europeans landed on the North American Continent they found no domestic animals except the dog. The natives knew nothing of the cow, horse, ass, sheep, goat, or swine.

The introduction of cattle on this continent was made at two points about the same time, but more than 2,000 miles apart, and separated by a vast unexplored country—one by the Spaniards in the West Indies, the other by Portuguese on Cape Breton Island.

Photograph by Lieut. Col. Alfred Heinicke

DOUBLE THRESHING IN PERSIA

Following Columbus' voyages and discoveries of the islands of the West Indies group, the Spaniards made strong efforts to colonize their new possessions. Domestic animals came with the colonists. When Cortez landed at the mouth of the Rio Panuco, on the eastern Mexican coast, in March, 1519, unloading with his army "sixteen horses, seven or eight of them mares, as mounts for his soldiers," he may have brought also cattle and sheep, but his report to the king mentions only horses.

The first reliable data as to cattle are contained in a written report found in the Spanish Archives at Madrid, to the effect that Gregorio Villalobos in 1521 went to New Spain (now Mexico) as governor general or viceroy. Villalobos landed near the present town of Vera Cruz, Mexico, and, according to the manuscript, "brought a number of calves from Santo Domingo, he being the first to bring them to New Spain."

This date, 1521, may be accepted as authentic, since it is substantiated by documentary evidence.

Four years later, in 1525, Portuguese fishermen landed a few cattle and some hogs on Cape Breton Island, from which they were soon carried to Newfoundland and the adjacent mainland.

In 1538 Mendoza, then viceroy of New Spain, wrote a voluminous report to his sovereign as to the progress of the new colony, and spoke of the favorable condition of his cattle, horses, and merino sheep, which he had imported from Spain. The sheep, he explained, had been especially prolific.

Two years later, when Coronado left the little town of Compostela, on the west coast of Mexico, near the present town of Tepic, on his famous expedition to the northeast, in search of the "Seven Cities of Cibola" (see, also, text, page 623) he had about 260 horses for his soldiers, more than 1,000 horses and mules as pack animals to carry food and equipment, and "large droves of big and little cattle" (*ganado major, y ganado menor*).

Ganado means "livestock," as we use that term. Ganado major, therefore, may be freely translated as cattle, and ganado menor as sheep, goats, hogs, etc.

One writer says that Coronado had "5,000 sheep and 150 cattle," but these figures probably refer to a later expedition, in 1595, by Juan de Oñate, who undoubtedly took these large numbers of domestic animals with him to New Mexico.

On August 3, 1540, Coronado, then well on his way to what is now Arizona and New Mexico, wrote to Mendoza, Viceroy of New Spain, from a point on the Yaqui River, in northern Mexico, that "large numbers of the animals sent as provision for the army were lost . . . on account of the roughness of the rocks. The lambs and wethers lost their hoofs along the way." He further urged Mendoza to send more cattle (ganado major).

Coronado, Fray Marcos de Niza, Oñate, and several other *conquistadores*, who explored the Southwestern regions, undoubtedly took with them numbers of cattle and other domestic animals. These were the foundation stock of the cattle of the great Southwest, including

Old Mexico, Arizona, New Mexico, and Texas, from which came the Longhorns of Texas and, ultimately, the whole cattle industry of the West.

These animals naturally reflected the types of Old Spain and were not so good as the British breeds. They were probably of Andalusian stock, with heavy fore and light hind quarters, thick necks, large, coarse heads, and, if the few pictures extant are reliable, possessed unusually long, sharp horns. They were light-bodied and very quick and agile on foot.

Little is known of the colors of the original importations. In describing the color of Bison calves he saw on the plains of eastern New Mexico in 1541, Coronado says: "The calves (*becerros*) are red in color, like our own cattle." The descendants of the Spanish cattle, however, were of varied colors, reds being, if anything, in the minority, with blacks, fawns, brindles, and yellows the dominant colors.

Willis Fletcher Johnson, in his "History of Cuba," says:

"The original cattle were of a type peculiar to Spain in the sixteenth century—rather small, well-shaped and handsome animals of a light-brown or dark Jersey color, similar to the wild deer in shade, and usually carrying a dark streak along the spine, with a rather heavy cross of black at the shoulders."

The Spanish cattle were not distinguished either as flesh-makers or for dairy quality, since they were the product of a land where forage was not especially abundant. Hardiness and ability to thrive under primitive conditions were their chief recommendations. They were probably the one European type best fitted at that date to thrive and multiply amazingly upon the great grazing grounds lying within the areas first taken over by Spanish arms in the Western Hemisphere.

Some Andalusian cattle are said to have been landed on the eastern coast of South America in 1546, and from this group, supplemented doubtless by subsequent importations, the great herds that once roamed the open ranges of what are now Uruguay, Paraguay, and Argentina were descended. The nutritious grasses of the New World and the almost limitless quantities stimulated rapid propagation.

In fact, in the course of time, the herds so vastly exceeded in numbers the food requirements of a comparatively sparse human population that they were slaughtered by thousands for their hides. Between 800,000 and 1,000,000 hides were shipped from Buenos Aires and Montevideo to Europe as early as 1796, and a similar trade in the hides of the old Spanish Longhorns existed along the coast of what is now southeastern Texas as late as the era just preceding our Civil War.

Such was the foundation upon which our present Western cattle business was originally based, and the final passing of the Longhorn from our own territory has occurred within the memory of men still living.

Cattle approximating the old type are still to be seen in parts of Old Mexico, but a grading-up process is doubtless destined to eliminate them entirely from the North American Continent. The type has disappeared in all our Western States, having been displaced by generous infusions, first of the blood of the Shorthorn, and then of the hardy, heavy-bodied English Hereford (see page 680).

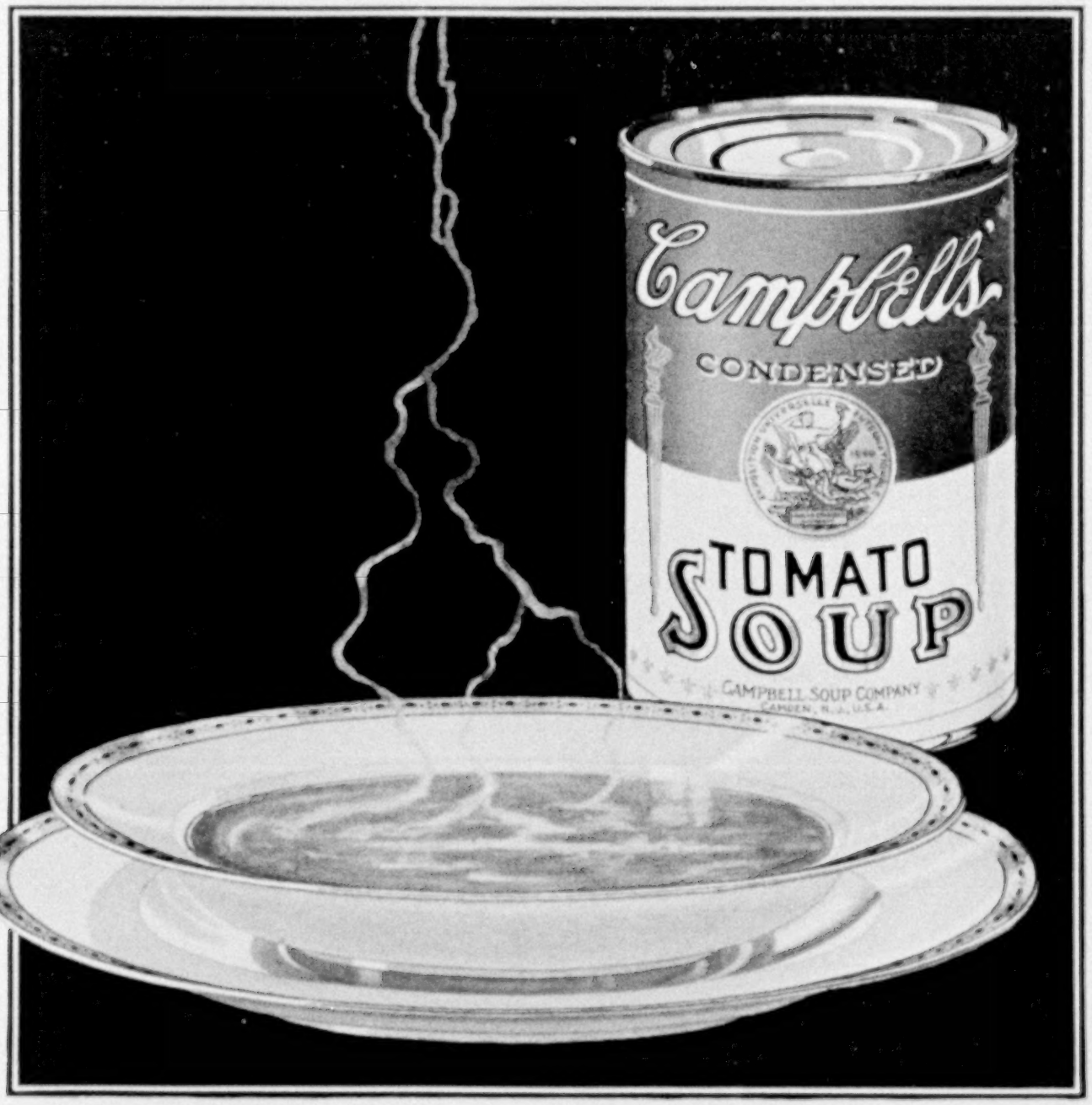
Mr. Will C. Barnes, of the United States Forest Service, commenting upon the passing of the Longhorn from the Western ranges, relates that some years ago the supervisor of the small national forest in Oklahoma located a two-year-old white steer in a trail herd of southern-Texas cattle, bound north, that showed evidences of close relationship to Longhorn stock. An old-timer himself, he loved the breed and bought the bullock merely to preserve the type as long as possible.

For almost 20 years that giant, rawboned white ox, long of horn, narrow-hipped, and leggy as an elk, was viewed by thousands of Texans who knew his kind only in stories of early days and as something that had gone out of existence. "This specimen," Mr. Barnes adds, "was 'kodaked' so often that he seemed to enjoy the proceeding, posing and never moving until he heard the click of the shutter."

It is to be regretted that a group of these Longhorns has not been preserved, along with our Bison herds, so that coming generations might study them as interesting zoölogical specimens.

[The author desires to express his obligation to Dr. R. K. Nabours, zoölogist at the Kansas State Agricultural College; Prof. Charles Sumner Plumb, of the College of Agriculture, Ohio State University; W. C. Barnes, of the United States Forest Service, and various officials of national associations of cattle breeders, for valuable assistance rendered in assembling the data necessary for the preparation of the foregoing sketches.]

APPETITE IS THE KEY TO HEALTH !



Healthy people have good appetites. One of the first questions the physician asks you: "How is your appetite?"

Soup stirs the appetite and nourishes as well. Haven't you noticed how a delicious plate of hot soup stimulates your desire to eat more plentifully?

Campbell's Tomato Soup, for example. The rich tomato juices and luscious tomato "meat" are strained to a fine puree, blended with fine country butter and delicately seasoned.

Such a soup has precisely that lively flavor so quickening to the appetite. It imparts a glow to the entire meal—gives you that whole-souled interest in your food which is the real index of your health.

21 kinds 12 cents a can

LOOK FOR THE RED-AND-WHITE LABEL

Safeguarding the lanes of speech

The New York-Chicago telephone cable has been completed and is now in service. A triumph of American telephone engineering, the new cable is the result of years of research and cost $25,000,000 to construct. Its first reach extended along the Atlantic seaboard, then steadily westward until this last long section to Chicago was put into service.

To the public, this cable means dependable service irrespective of weather conditions. It is now not likely that sleet storms, which at times interfere with the open wire type of construction with 40 to 50 wires on a pole, will again cut off the rest of the nation from New York or from the nation's capital as did the heavy sleet storm on the day of President Taft's inauguration.

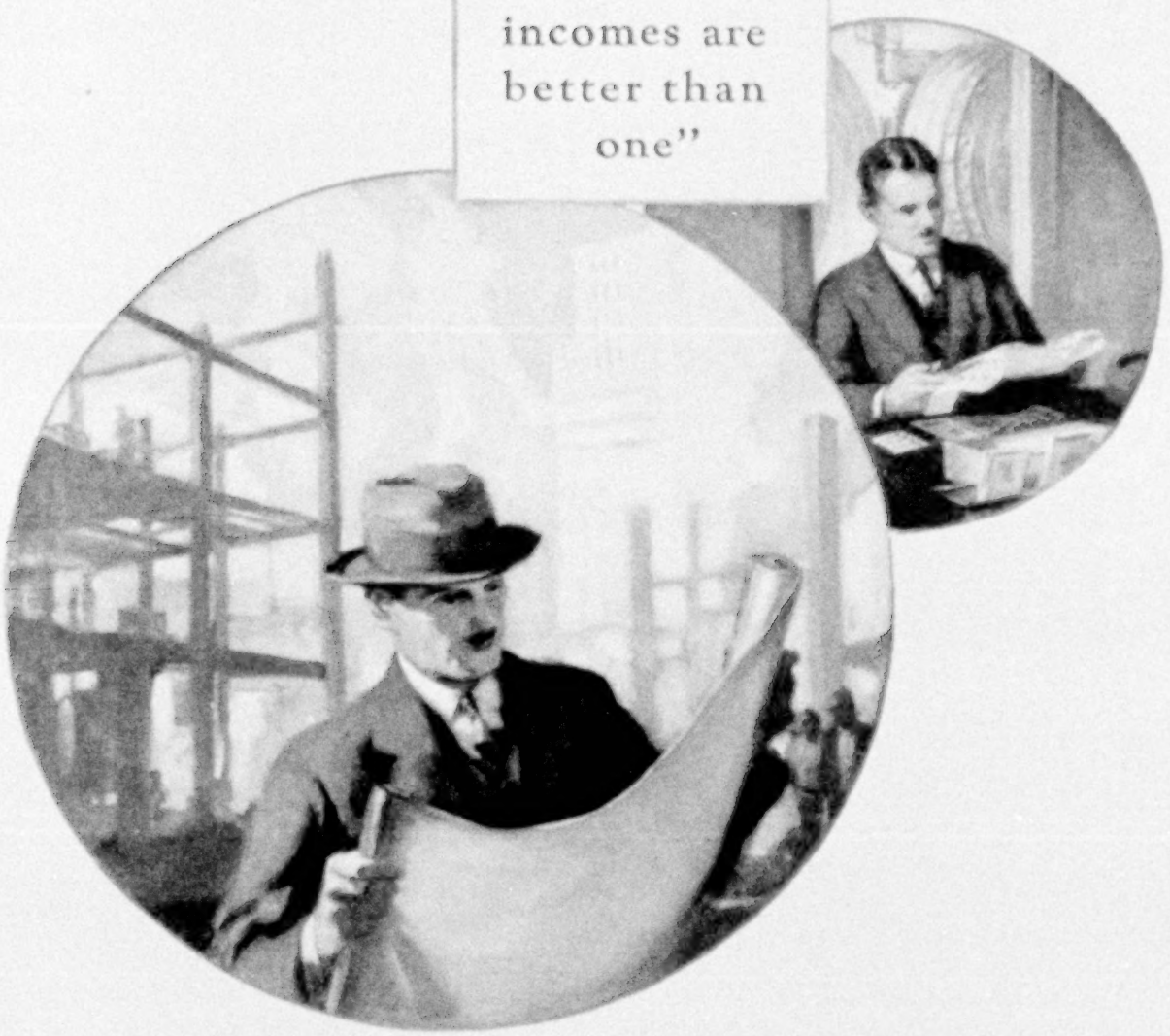
The new cable means speedier service, as it provides numerous additional telephone circuits and will carry a multitude of telephone and telegraph messages. It would take ten lines of poles, each heavily loaded with wires, to carry the circuits contained in this most modern artery of speech.

This cable, important as it is, is only one of the Bell System projects that make up its national program for better telephone service to the subscriber. It is another illustration of the System's intention to provide the public with speedier and even more dependable service.

AMERICAN TELEPHONE AND TELEGRAPH COMPANY
AND ASSOCIATED COMPANIES

BELL SYSTEM

One Policy, One System, Universal Service



Wise planning ~ certain progress

THE professional man should take care to supplement his present income by the income from well-chosen securities. Wise investing now means less worry and more comfort later on.

Ill-considered speculations, needless spending—both heavy drains on resources—find no place in the planning of a second income. That is why the consistent bond buyer has so much to show for his effort.

Our offices in fifty leading cities are ready to analyze your requirements and suggest suitable offerings.

THE NATIONAL CITY COMPANY

National City Bank Building, New York

BONDS · ACCEPTANCES
SHORT TERM NOTES

Offices in more than 50 leading cities throughout the world

DOUBLECAP, at the right in the picture, is new but already popular. Holder Top, at the left, is an established favorite, probably the best known shaving stick in the world. There are reloads for both.

Your choice ~~ both are Williams

Some men prefer Holder Top, others Doublecap, but they all want Williams

WHETHER you will like the new Williams Doublecap Shaving Stick better than Holder Top, we can't tell; each has an army of friends. You can see the differences: Doublecap has two equal-sized metal holders meeting on a metal ring in the center of the stick. Holder Top has its holder at one end of the stick. The soap is held by a threaded metal ring. No chance of its working loose.

Both these sticks give the same rich, abundant lather for which Williams is famous. No one has quite duplicated this lather. It works up abundantly on the face from the very start. It holds its moisture in close against the beard. All of every hair is swiftly saturated. You shave, and there is an unaccustomed feeling of comfort because your beard has really been softened.

After the shave with Williams, your face feels soft and refreshed, free from the irritation that inadequate softening often brings.

Examine both Holder Top and Doublecap at your dealer's. Start shaving tomorrow with the one that appeals to you more. Whichever you choose, you'll win, for both are Williams. From either, you get the real Williams shave.

Aqua Velva is our newest triumph—a *scientific* after-shaving preparation. A few drops keep the face like velvet all day. We will send a 150-drop test bottle free. Address Department 512.

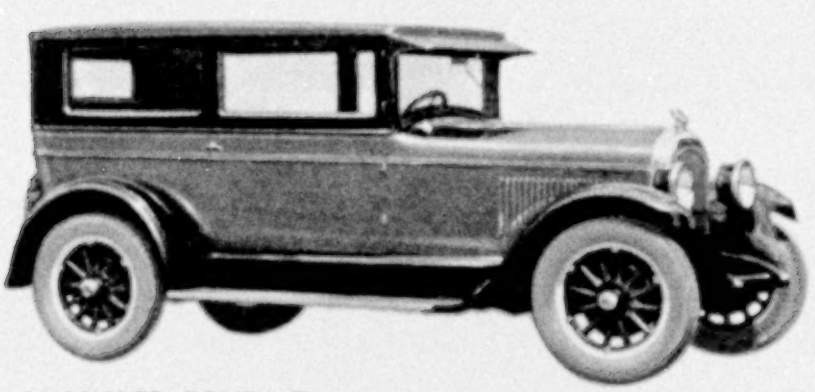
The J. B. Williams Company, Glastonbury, Conn. (If you live in Canada, address The J. B. Williams Co., Limited, St. Patrick Street, Montreal)

Williams Shaving Sticks

58 MILES PER HOUR
25 MILES to the GALLON
5 to 25 MILES in 8 SECONDS

Only Chrysler Four Combines These Performance Abilities

The Chrysler Four's extraordinary performance—itself the direct and positive evidence of the highest quality in design, materials and craftsmanship—literally leaves no alternative in its field.



In speed, the Chrysler Four gives you a new standard—58 miles an hour, achieved quickly and easily, not for a momentary spurt, but for eager mile after mile, as long as you like.

When you would dash away ahead of the crowd in traffic, the Chrysler Four whisks you from 5 to 25 miles in eight seconds—with sure-footed reliability and purring smoothness.

Yet, with all the super-power necessary for such speed and such swift pick-up, you can get 25 miles to the gallon.

Any one of these exceptional abilities would be sufficient evidence of value for any manufacturer except Chrysler: the three of them clinch the assurance of Chrysler Four's transcendent quality and worth.

Any Chrysler dealer is eager to afford you the opportunity of proving the superiority of this favored Four. We ask you to ride in the car—drive it—see and feel for yourself, its speed, its swift response, its smooth operation, its riding steadiness and comfort. Then, we believe, you will inevitably share in the enthusiasm of its tens of thousands of owners.

CHRYSLER SALES CORPORATION, DETROIT, MICHIGAN
CHRYSLER CORPORATION OF CANADA, LIMITED, WINDSOR, ONT.

CHRYSLER FOUR—*Touring Car, $805; Club Coupe, $995; Coach, $1045; Sedan, $1095. Hydraulic four-wheel brakes at slight extra cost.*
CHRYSLER SIX—*Phaeton, $1395; Coach, $1445; Roadster, $1625; Sedan, $1695; Royal Coupe, $1795; Brougham, $1865; Imperial, $1995; Crown Imperial, $2095.*
All prices f. o. b. Detroit, subject to current Federal excise tax.
Bodies by Fisher on all Chrysler enclosed models. All models equipped with full balloon tires.
There are Chrysler dealers and superior Chrysler service everywhere. All dealers are in position to extend the convenience of time-payments. Ask about Chrysler's attractive plan.
All Chrysler models are protected against theft by the Fedco patented car numbering system, exclusive with Chrysler, which cannot be counterfeited and cannot be altered or removed without conclusive evidence of tampering.

CHRYSLER FOUR

The NOBEL

There is no "sterling" stamp for men

No carat-mark, as there is for gold, to tell you who is a real man.

But there are invisible stamps and signs that unmistakably point out a man. Not clothes entirely!

Yet if you find a man near the top in his chosen field; a man with the "habit of success"; one who demands and gets the best that life has to offer in all things —you may be sure he will carry his judgment into the personal articles of wear.

That so many such men wear Banister Shoes is a tribute to the shoes. For more than eighty years it has been our pleasure to make shoes that these men instinctively knew were right for them.

Perhaps we can tell you which shoe-man near you can show you Banister Shoes. Please ask us if you do not know.

JAMES A. BANISTER COMPANY
NEWARK, NEW JERSEY

BANISTER SHOES

Since 1845 the choice of Gentlemen

As you open the camera the lens springs into place.

The Camera for Christmas

No. 1A Pocket Kodak

Series II

There are two chief reasons why this camera makes particularly good pictures:

First The lens is the famous Kodak Anastigmat *f*.7.7 that cuts sharp and gives you snappy prints and enlargements.

Second The shutter is the accurate Diomatic that shows you on its dial the correct exposure to make under the existing light conditions, and then times that exposure exactly.

Sharp pictures, correctly exposed, *must* be good pictures. That's why the 1A, Series II, is a camera you'd like to get or be glad to give.

Price $26, at your dealer's

Made with 1A, Series II, size 2½ x 4¼ inches

Eastman Kodak Company, Rochester, N.Y., *The Kodak City*

THE CURTIS INSTITUTE OF MUSIC

PERMANENTLY ENDOWED BY MARY LOUISE CURTIS BOK

MADAME SEMBRICH

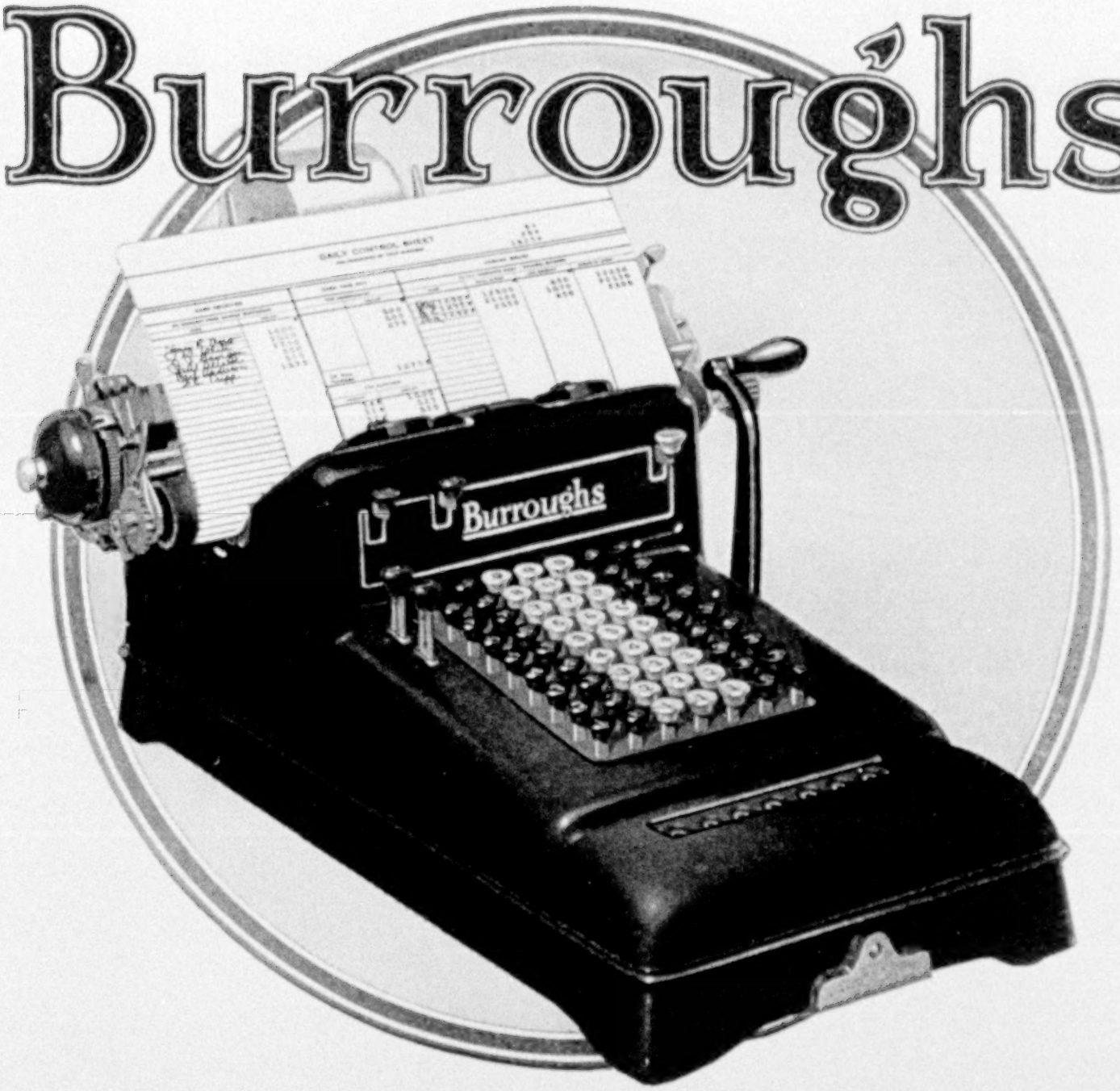
AND

MR. JOSEF HOFMANN

CAN ACCEPT NO MORE VOCAL OR
PIANO STUDENTS FOR THIS SEASON

RITTENHOUSE SQUARE
PHILADELPHIA

Burroughs



Burroughs Quality is Proved by 40 YEARS of - Undisputed Leadership.

BURROUGHS ADDING MACHINE COMPANY
6286 SECOND BOULEVARD DETROIT, MICHIGAN

ADDING • BOOKKEEPING • CALCULATING AND BILLING MACHINES

FADA Radio

All the comforts of home

WITHOUT doubt radio holds them at home—they need no longer seek amusement in less desirable environments!

But nowadays it is not enough to have radio—one must have *superlatively good radio*, for the rising generation are particular as to pleasure.

"Fada Radio—the Standard of Reception" is radio at its best.

Listen in yourself—The nearest Authorized Fada Radio Dealer will gladly demonstrate Fada Radio in his store or in your own home—call him *today*—there is no charge for this convincing demonstration.

Most Fada dealers will be glad to arrange convenient terms of payment. Send to 1581 Jerome Avenue, New York, for free book E, "Fada Radio—the Standard of Reception".

F. A. D. ANDREA, INC.

CHICAGO NEW YORK SAN FRANCISCO

FADA RADIO, LTD.—TORONTO FADA RADIO, LTD.—LONDON

Manufacturers of TUNED RADIO FREQUENCY *receivers using the highly efficient* NEUTRODYNE *principle*

There is a Fada Radio model for every purse—all 5 tube Neutrodyne sets for dry cell or storage battery tubes, from $85 to Art Cabinet models up to $300. Illustrated is the Queen Anne Desk at $300.

NEUTRODYNE

DODGE BROTHERS

SPECIAL TYPE-A SEDAN

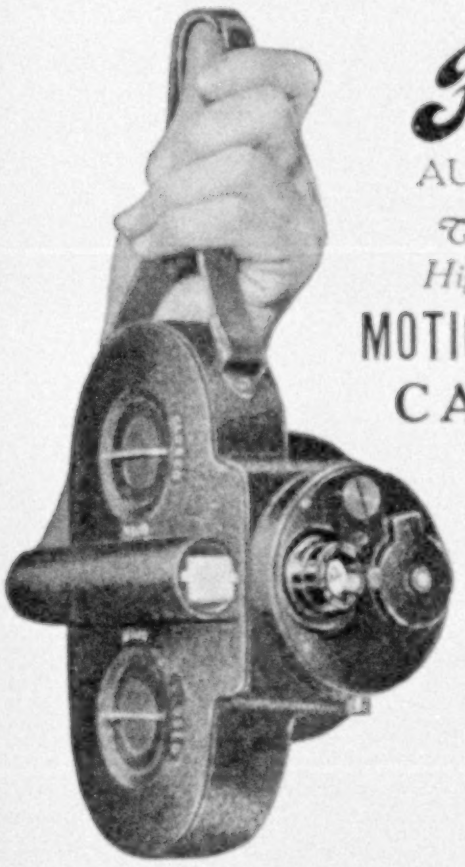
The aristocrat of Dodge Brothers line of closed cars. Yet so dependably built is the Special Type-A Sedan that frequently you find it serving under conditions that would try the sturdiest open cars.

This amazing capacity for long life and hard work is recognized everywhere as the outstanding characteristic of Dodge Brothers product.

It is strikingly evidenced by the fact that more than 90% of all the motor cars Dodge Brothers have built during the past eleven years are still in active service—a record which stands impressively alone in automobile history.

Ask your dealer about Dodge Brothers New Credit-Purchase Plan

A Christmas Gift EXTRAORDINARY!



Filmo

AUTOMATIC

The World's Highest Quality

MOTION-PICTURE CAMERA

for the Individual

Like sighting a spyglass. The only quick and accurate method of view finding with cinematograph equipment.

THIS is for people who wish to avoid the commonplace in Christmas-giving. The FILMO Automatic is an unusual gift—it is an unusual camera. J. P. Morgan, W. K. Vanderbilt, James Stillman, Galli Curci, Vice-President Dawes, H. R. H. the Prince of Wales, and many other universally known people are typical FILMO owners.

Simple to Operate

Anyone can operate FILMO. Raise it to the eye, like sighting a spyglass, touch a button, and you automatically get pictures of the same quality as those shown in the better theaters. No guesswork. No cranking. No tripod necessary. Full directions accompany each camera.

Unusual Pleasures

With FILMO you perpetuate family scenes, social events, travel, outings, sports—in pictures that *live*. Show your pictures on a wall, curtain, or screen in your home, club, or anywhere by means of the FILMO Projector. Works automatically by attaching to any electric-light socket. Book of directions tells how.

Your Guarantee of Quality

FILMO Camera and Projector are designed by Bell & Howell Co., who supply 95% of the professional motion-picture cameras and equipment used in studios the world over. FILMO built as accurately and precisely as our $5,000 studio cameras. This is your guarantee of the utmost in quality and service. Present a FILMO for Christmas. Sold by leading dealers everywhere. Write us for descriptive booklet, "What You See You Get"

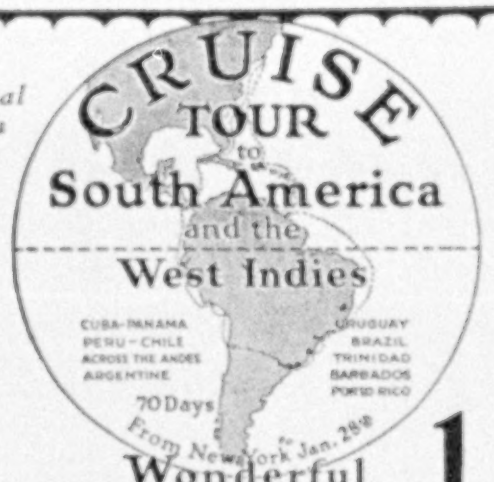
Keep a motion-picture record of your travels.

Booklet "What You See You Get" tells the whole interesting story.

Write for it!

BELL & HOWELL CO.
1817 Larchmont Ave.
CHICAGO, ILL.
NEW YORK HOLLYWOOD

7th Annual American Express



2 Wonderful cruises in 1

Seventy happy days—a palatial steamship—sailing away from Winter—through the sunny islands of the West Indies to the gorgeous ports of South America. Through the Panama Canal, over the Andes, along the Spanish Main—you traverse scenes rich in historical and romantic interest. Total cost (including all shore excursions) $1850 and up. As reservations are made in the order received, and as the party will be strictly limited, you should write at once for Booklet "F" showing deck plans with full itinerary and other details.

American Express Travel Dept.
65 Broadway, New York

Always carry American Express Travelers' Cheques

Come to Daytona Beach, where winter is softened into a northern spring. Enjoy the world's finest beach. Boating and fishing on the Halifax and Tomoka Rivers. Golf, tennis, lawn bowling, roque, and all kinds of outdoor recreation. Best accommodations. For booklet, address:

Daytona Beach Chamber of Commerce

203 Chamber of Commerce Building, Daytona, Florida

DAYTONA BEACH
FLORIDA

The New Improved

Gillette

SAFETY Gillette RAZOR

Above:
The Traveler:
In Gold Plate, $10.00
In Silver Plate, $7.50
Genuine leather case

AT CHRISTMAS, there is one sure way to give your friendship an outward expression that a man cannot mistake—give him a New Improved Gillette! It guarantees him a perfect shave in comfort every day in the year—and he will bless your thoughtfulness as his attachment increases for this faultless shaving instrument.

GILLETTE SAFETY RAZOR CO., BOSTON, U. S. A.

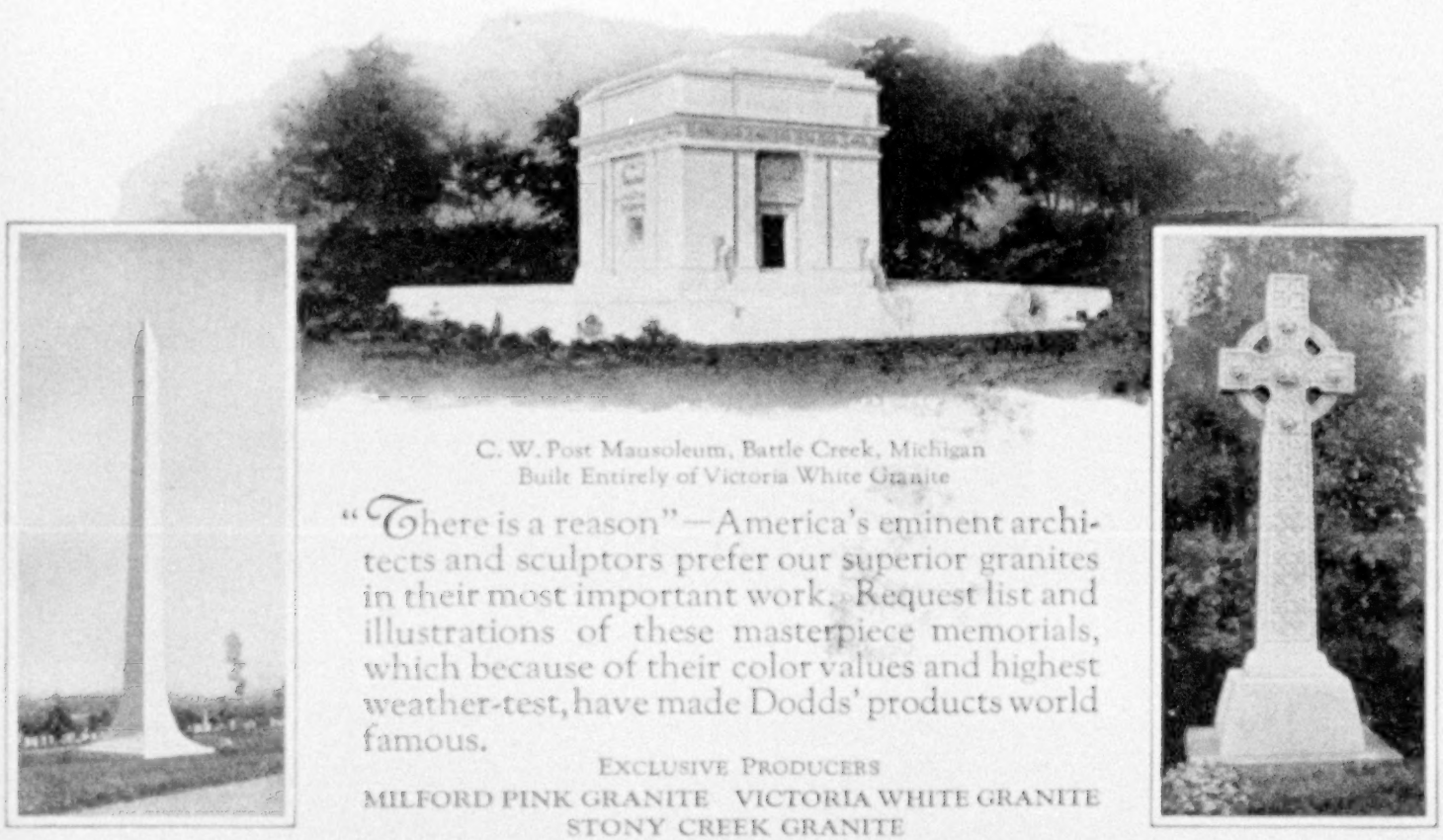
The Bostonian:
In Gold Plate, $6.
In Silver Plate, $5.

The Big Fellow:
In Gold Plate, $6.
In Silver Plate, $5.

The New Standard:
In Gold Plate, $6.
In Silver Plate, $5.
Genuine leather case

The Richwood:
In Gold Plate, $6.
In Silver Plate, $5.
Mahogany finish wood case

The Tuckaway:
In Gold Plate, $6.
In Silver Plate, $5.



C. W. Post Mausoleum, Battle Creek, Michigan
Built Entirely of Victoria White Granite

"There is a reason"—America's eminent architects and sculptors prefer our superior granites in their most important work. Request list and illustrations of these masterpiece memorials, which because of their color values and highest weather-test, have made Dodds' products world famous.

EXCLUSIVE PRODUCERS
MILFORD PINK GRANITE VICTORIA WHITE GRANITE
STONY CREEK GRANITE
(The above names protected by trade mark)

THE DODDS GRANITE COMPANY

[ESTABLISHED 1864]

814 PERSHING SQUARE BUILDING, NEW YORK CITY

Quarries and Manufacturing Plants: MILFORD, MASS. KEENE, NEW HAMPSHIRE STONY CREEK, CONN

Your Copy of Booklet "M" Sent if Requested

The Most Extensive Quarrying and Manufacturing Facilities in the Entire Industry

---

A Christmas Gift for Every Member of the Family

MOLLOY-MADE GEOGRAPHIC COVERS will preserve these wonderful magazines in beautiful library binding. They are made of highest grade durable leather-like cloth finished in two-tone hand-colored brown and deeply embossed. Each cover holds six numbers. Bind these yourself—it is easy with the punch and instructions we furnish.

Order now—$2.00 each or $3.65 a pair. Specify volume and year desired. Covers can be supplied for all years back to 1910 and for 1926. Your money refunded if you are not delighted with them.

The David J. Molloy Company
2863 North Western Avenue
Chicago:

Enclosed find $....., for which send me.....pairs of Geographic Covers, Vols.....for years ..... If I am not entirely satisfied, I will return the covers within ten days and my money will be cheerfully refunded.

Name .....

Address .....

THE DAVID J. MOLLOY COMPANY
2863 North Western Avenue, Chicago, Illinois

MOLLOY MADE
Good Covers for Good Books

This may save you thousands of dollars

You, as a business or professional man, undoubtedly appreciate the tremendous importance of insurance, but do you understand the importance of keeping your insurance up to date?

Change the circumstances under which a policy was originally written, and you may be over-insured or under-insured. You may be paying too high a premium or you may have made changes which entitle you to more protection for the same premium.

You may have made additions and improvements to your property or extensions of your business operations which are not adequately insured by your present policies. Your personal forms of insurance protection which you have provided for yourself and your dependents may not have kept pace with present-day requirements.

The Ætna Life Insurance Company and affiliated companies have met these conditions so frequently that they have evolved a plan aimed to correct them wherever they exist.

Briefly, this Ætna Plan includes:

First—A thorough investigation, or survey, of your general insurance requirements.

Second—A careful examination, by experts, of the insurance carried.

Third—The preparation and presentation of a permanent record—an *insurance chart*—setting forth what the survey and investigation have disclosed.

Fourth—A written report showing how the requirements—as disclosed by the chart—can be met.

Fifth—Continued attention to your insurance needs, and the keeping of the chart up to date.

The Ætna Plan has been especially valuable to business and professional men who have large responsibilities. It is highly recommended also to young men in business or professional life who are just starting to build a program of protection through insurance. Trust companies, lawyers, real estate organizations, executors and administrators of estates—all those charged with the care of property—will find this plan of great value.

The Ætna affiliated companies are foremost, among multiple-line companies, in the number of lines written and in financial strength. They have dealt in protection for 75 years. They have facilities for covering any risk, regardless of size, and they maintain service offices in every section of the country.

The Ætna representative in your community is equipped to render you the service provided by the Ætna Plan, and will gladly do so. He is trained in the fundamentals and practice of insurance and bonding to a degree not surpassed in the long history of his profession.

Are *you* sure that your present insurance protects you as it should? Let us send you a booklet which tells you in greater detail about the Ætna Plan. The coupon is for your convenience.

Ætna Life Insurance Company and
Affiliated Companies, Hartford, Conn.

Gentlemen: Please send me your booklet which describes the Ætna Plan in detail.

Name.....

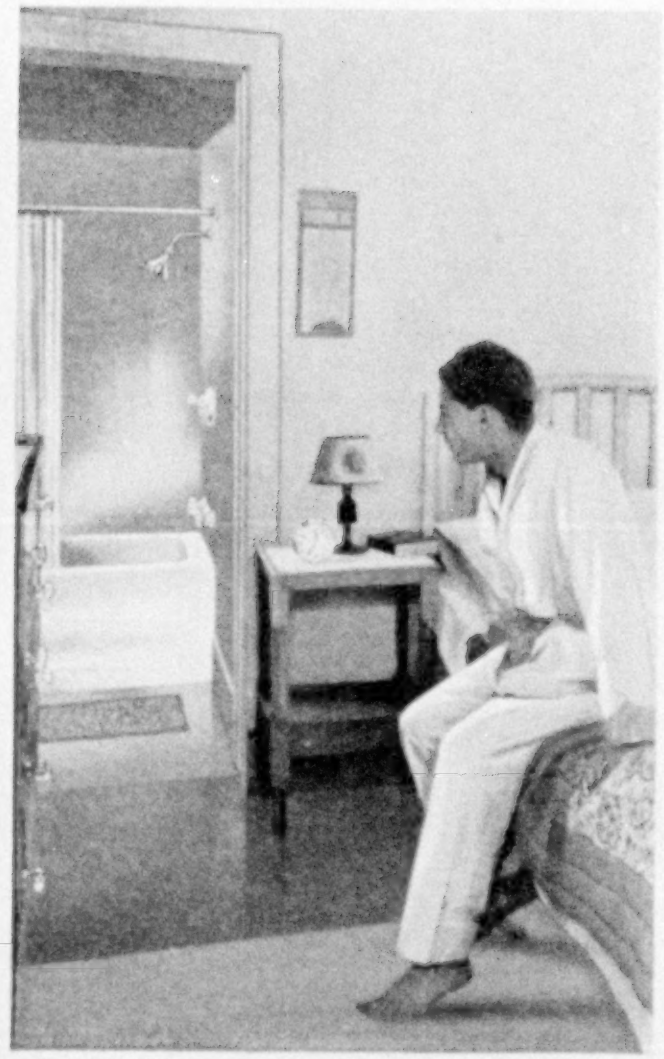
Business.....

Address.....

ÆTNA-IZE

ÆTNA LIFE INSURANCE COMPANY AND AFFILIATED COMPANIES

Ætna Casualty and Surety Co. Standard Fire Insurance Co. Automobile Insurance Co., of Hartford, Conn.



Now for his shower

and he knows that it will work

ONE thing about SPEAKMAN Showers—they *always* work. Whether the shower has the Mixometer, for mixing hot and cold water, or separate valves, you can depend that mechanically they will always be right!

The reason for the dependability of SPEAKMAN Showers is in the quality of materials used in them—their sturdy construction, and finally the tests to which we subject all parts before they are shipped. This also is true of SPEAKMAN bath, lavatory and sink fixtures.

The sturdiness of SPEAKMAN Showers is one reason why they are so universally used in hotels and institutions, where they often receive extremely hard usage.

We'll be glad to send you a booklet showing many of the processes in the manufacture of SPEAKMAN Showers. At the same time, we will send booklets describing and illustrating various types of SPEAKMAN Showers; also literature quoting authorities on the health value of the shower.

SPEAKMAN COMPANY
WILMINGTON, DELAWARE

SPEAKMAN SHOWERS
and FIXTURES

Frank's 4th Annual Cruise de Luxe TO THE Mediterranean

Egypt—Palestine

Madeira, Spain, Gibraltar, Algiers, Tunis, Constantinople, Greece, Italy, Sicily, Riviera, Monte Carlo, France, England.

By Specially Chartered Magnificent New 20,000-Ton

Cunard S. S. "Scythia"

Sailing from New York January 26—67 days
(Limited to 400 Guests—less than Half Capacity)

The Cruise of the "Scythia" has become an annual classic. In every respect it is unsurpassed. Prearranged shore excursions at every port included in the rate. Finest hotels and the best of everything. Unusually long stay, at the height of the season, in Egypt and Palestine.

Stop-over privilege in Europe without extra cost, returning via S. S. "Aquitania," "Mauretania," "Berengaria," or any Cunard Line Steamer.

Also EUROPEAN TOURS—Frequent Departures

FRANK TOURIST CO.

542 Fifth Avenue, New York
At Bank of America, Los Angeles. 582 Market St., San Francisco
1529 Locust St., Philadelphia
(Est. 1875) *Paris* *Cairo* *London*

SOUTH AMERICA
by the Famous V-FLEET

The voyage from New York is an unfailing stimulant to health and interest. South America reveals to the visitor a new field of pleasure, rich in scenic splendor and historic lore. Its magnificent cities are unsurpassed for beauty and grandeur.

The palatial steamers of the famous V-FLEET, specially built for this Service, are the finest plying to South America. All outside staterooms. Excellent menus. Steward service of the highest type.

BARBADOS—RIO DE JANEIRO
MONTEVIDEO—BUENOS AIRES
Calling northbound at SANTOS AND TRINIDAD

45 days, $675

Special Cruise Tours, including RIO for the Mardi Gras, all expenses included, S. S. Voltaire, Jan. 25.

58 days, $850

Regular Sailings by the

S. S. Voltaire
S. S. Vandyck
S. S. Vauban
S. S. Vestris

For illustrated literature, etc., apply Sanderson & Son, Inc., 26 Broadway, N.Y., or your local S.S. or tourist agency.

LAMPORT & HOLT
"The Better Way" LINE

KREMENTZ CORRECT JEWELRY FOR MEN

Want to please him, ---especially?

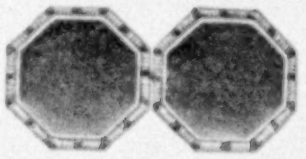
Then make him a present of Krementz jewelry! There are many distinctive designs from which to choose. Superior quality is assured in the Krementz guarantee which covers a lifetime of wear or replacement free. Back of this guarantee is a firm established for 59 years.

Krementz jewelry enables you to give widely and wisely. For instance, a gift box holding two Krementz collar buttons in 14 kt. solid gold costs but $3.75; in 10 kt. solid gold $2.75; in 14 kt. rolled gold plate $.75. Handsomely cased links, engine turned designs, as low as $3.00 a pair; some of the exquisite hand brocaded patterns up to $6.00 a pair.

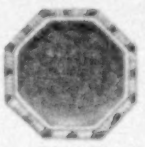
To wear with his evening clothes, give him either a Tuxedo Set, costing from $4.50 to $15.00, or a Full Dress Set, from $7.50 to $25.00. All in attractive cases. Each piece has the name Krementz stamped on the back.

Your dealer probably has Krementz jewelry. Write us for illustrated folders.

Full Dress Set
White Metal Rims, Black Mother of Pearl Centers



1744 K Pair Links



1745 K
4 Vest Buttons

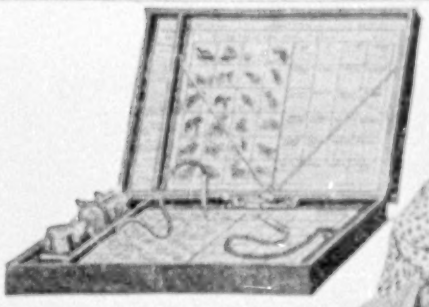
1746 K
3 Studs

Above Complete Set in Beautiful Gift Case, $14.00

2138 K $3.50 Pair
14kt. Rolled White Gold Plate

Krementz
COLLAR BUTTON
Newark New Jersey

For Everybody's Christmas



IT'S not often a game can hold a grown up as well as a 5-year old. But that is the unique power of the

ELECTRIC QUESTIONER

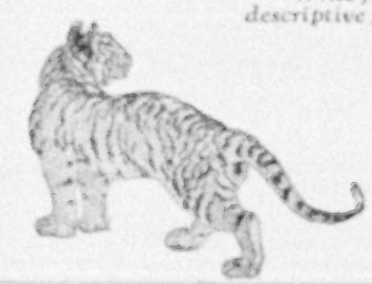
which has made it the most fascinating game ever invented. It is always ready to answer questions upon any conceivable subject—geography, history, literature. It asks riddles that it alone can answer, it jokes and it teaches.

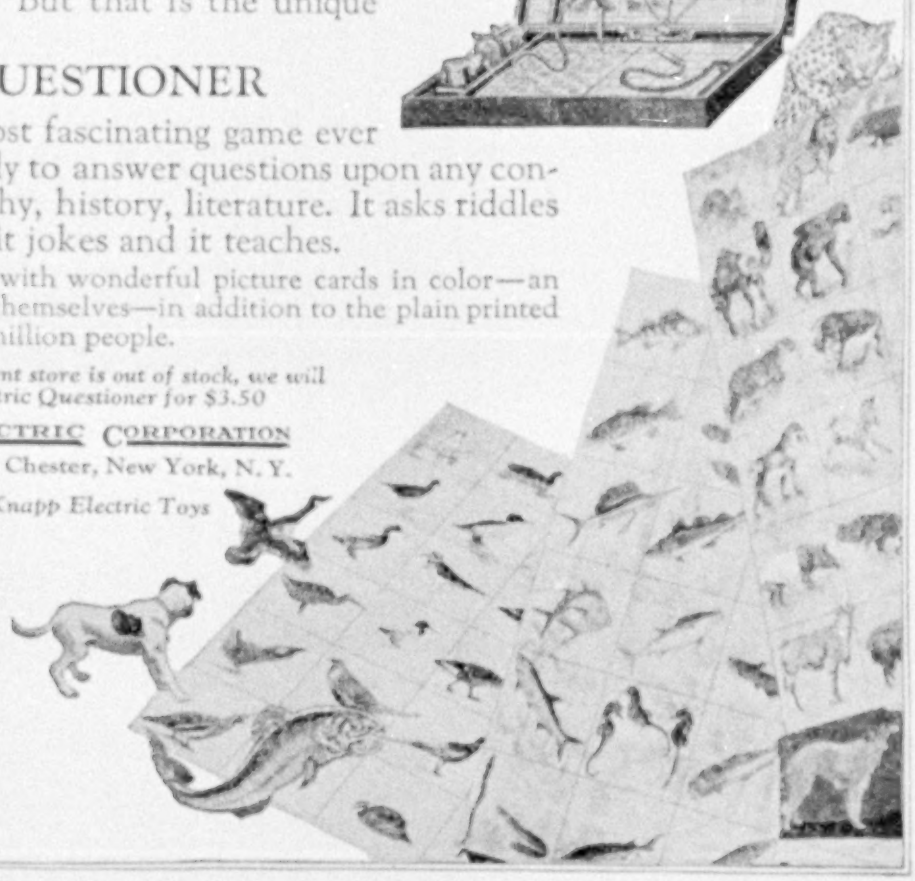
AND NOW, it is equipped with wonderful picture cards in color—an education in natural history in themselves—in addition to the plain printed cards that have entertained a million people.

If your toy or department store is out of stock, we will send you the Electric Questioner for $3.50

KNAPP ELECTRIC CORPORATION
Dept. 107 Port Chester, New York, N. Y.
Manufacturers of Knapp Electric Toys

Write for descriptive folder





The DRAKE

Lake Shore Drive and Upper Michigan Ave.
CHICAGO
Under THE BLACKSTONE *Management*

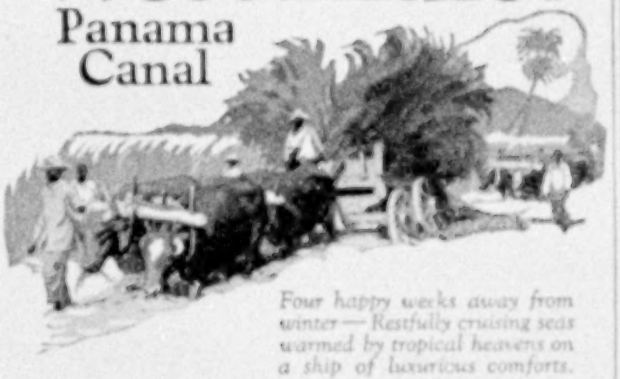
THE fascination of its surroundings and the incomparable nicety of service which impresses the first-time guest at THE DRAKE, Chicago, is reflected in the patronage record year after year. Thus is explained, perhaps, the reason why so many, who may change hotel accommodations from time to time, invariably come back to THE DRAKE.

Rates are moderate

LUXURY CRUISE

West Indies

Panama Canal



Four happy weeks away from winter—Restfully cruising seas warmed by tropical heavens on a ship of luxurious comforts.

Visits to colorful islands—Marvelously stimulating scenery—The refreshing strangeness of old West Indies civilizations and manners.

ITINERARY—Havana, Kingston, Colon (Panama), Cartagena, Curacao, La Guayra, Trinidad, Barbados, Martinique, St. Thomas, San Juan, Bermuda.

The "Veendam"

of 15,610 tons displacement

Leaving New York **Feb. 18,** 1926

Enjoys universal prestige for the unexcelled luxury and comforts of her appointments, for her superlative cuisine, and for the exceptional character of service and management on board.

Under the management of the HOLLAND AMERICA LINE in cooperation with the FRANK TOURIST COMPANY.

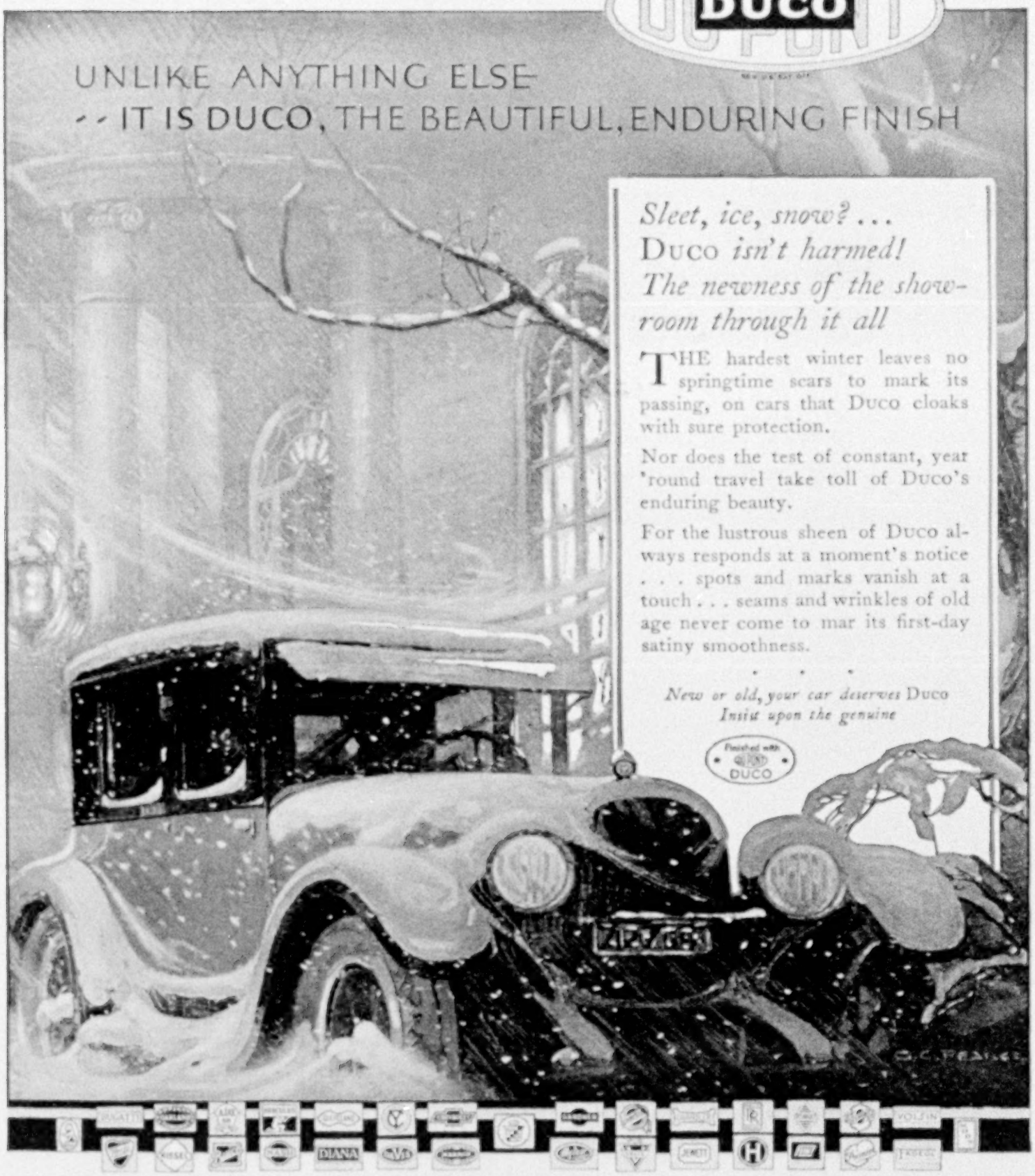
For choice selection of accommodations make reservations now.

HOLLAND AMERICA LINE
21-24 State Street New York
FRANK TOURIST CO. *or any authorized*
542 Fifth Avenue, New York *Steamship Agent*

DUPONT

DUCO

UNLIKE ANYTHING ELSE
-- IT IS DUCO, THE BEAUTIFUL, ENDURING FINISH



Sleet, ice, snow? . . .
Duco isn't harmed!
The newness of the showroom through it all

THE hardest winter leaves no springtime scars to mark its passing, on cars that Duco cloaks with sure protection.

Nor does the test of constant, year 'round travel take toll of Duco's enduring beauty.

For the lustrous sheen of Duco always responds at a moment's notice . . . spots and marks vanish at a touch . . . seams and wrinkles of old age never come to mar its first-day satiny smoothness.

. . .

New or old, your car deserves Duco
Insist upon the genuine

Finished with DUCO

AS a matter of pride and continued satisfaction, your car deserves the lasting beauty that comes only with the use of genuine du Pont Duco.

There's no condition of road or weather that Duco will not withstand . . . sand, alkalies, mud or grease; salt air, rain or snow do not mar it. The strongest soaps have no effect upon it. It is a finish which actually improves with use, and it may be easily kept lustrous by using Duco Polish No. 7.

No stronger commentary on the remarkable qualities of Duco can be offered than the fact that it is used by the automobile manufacturers whose trade-marks are shown above.

But the great advantages of Duco are not confined to owners of new cars. At your service are over 1600 Duco Refinishing Stations equipped to give cars a genuine Duco refinish from the bare metal up . . . or to apply a cheaper, perhaps less durable, surface by putting Duco over the old finish.

Identify the authorized refinisher in your locality by the official Duco sign. It means that he uses du Pont materials throughout.

DU PONT

E. I. du Pont de Nemours & Co., Inc., Chemical Products Division, Parlin, N. J., Flint, Mich., Chicago, Ill., San Francisco, Cal., Everett, Mass., or Flint Paint and Varnish Limited, Toronto, Canada.

There is only ONE Duco — DU PONT Duco

"What shall we give our boy for Christmas?"

Guns, footballs, dogs and such are necessary adjuncts of boyhood. They help a fellow grow up along the right lines. Along with a rifle would you like to give him the instinct to be a *"straight shooter"?* With a football a high sense of *"fair play"?* With a bull pup a generous measure of *"stick-to-it-iveness"?* With a sweater a warm respect for trustworthiness, courtesy to his elders?

You can't cram ideals into a boy by checking his craving for fun. But along with fun, you can inoculate him with character, subtly. Give him a year's subscription to THE AMERICAN BOY.

In this magazine, your son will associate with some of the finest men in the world. Authors who know boys, editors who know the boy mind. AMERICAN BOY stories are not the goody-goody type. There's life in them, adventure, justice, courage, success, failure. Stories woven around business, science, history, travel. The kind of stuff that shows a boy why the world values and rewards honest effort and square dealing. And how boys enjoy THE AMERICAN BOY!

Make your boy a Christmas present of a year's subscription to THE AMERICAN BOY. Mail the coupon today!

$2.00 a year by mail, 20c the copy at all news-stands. Subscribe for a year or leave a standing order at your news-dealer's.

The American Boy

THE SPRAGUE PUBLISHING CO.
No. 356 American Bldg., Detroit, Mich.

Enclosed find $2.00, for which send THE AMERICAN BOY for one year, beginning with the current issue, to

Name.....

Address.....

Canada, $2.25. Foreign, $2.50

Look Inside the Piano for this Trade-Mark

WESSELL, NICKEL & GROSS
NEW YORK
TRADE MARK

The Sign of the World's Standard Piano Action

Fine Pianos Have This Famous Action!

AS a prospective piano purchaser, you should know that leading American piano makers have used the Wessell, Nickel & Gross piano action for more than *fifty* years.

You should understand also, as do these piano makers, that tone and touch are controlled by the *piano action*—that piano quality must be matched by piano *action* quality to achieve a worthy instrument. Recognition of these facts is enabling music lovers to choose pianos of assured quality.

Furthermore, the Wessell, Nickel & Gross action is *the world's highest-priced piano action.* Its higher price is just another indication of its better quality. Naturally, it is chosen only by piano makers who build instruments of established excellence.

WESSELL, NICKEL & GROSS
Established 1874 New York City

When you Buy an Upright, Grand, Player or Reproducing Piano—Insist on the Wessell, Nickel & Gross Piano Action.

HARRISON MEMORIALS

Our staff of designers can help you crystallize your ideas into a memorial best suited to your specific purpose.

Write for Booklet "C"

HARRISON GRANITE COMPANY, Inc.
Established 1845
4 East 43rd Street At Fifth Avenue New York, N. Y.
Offices: Detroit Chicago Pittsburgh Minneapolis
Works: Barre, Vermont

FLOWERS telegraphed
for all occasions to any city, or
delivered in New York $5.00 and up
Gift Baskets $10.00 and up

MAX SCHLING INC.
"The Telegraph Florist of New York"
785 FIFTH AVE at 60th Street
Telephone: Regent 8060

A Gift Box of Crane's Cordlinear

Christmas gifts may be bought at any price—but

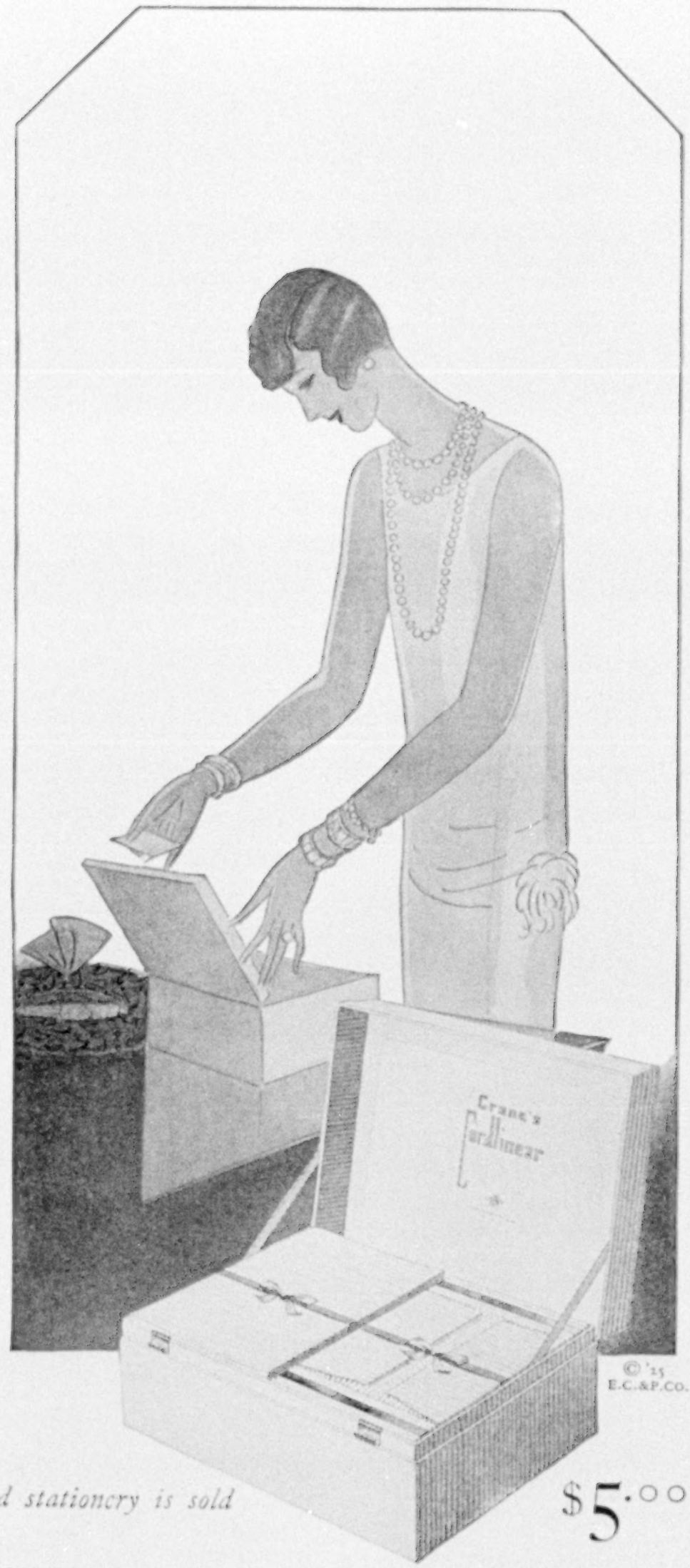
In its own class, each gift should be the very finest that money can buy. The best in motor cars, pearl necklaces, or sable coats costs thousands of dollars. But in writing paper, the very finest obtainable can be bought for as little as five dollars.

There is no gift more acceptable than this new holiday box of Crane's Cordlinear. It is at once a perfect expression of Christmas thought and a delicate compliment to the good taste of the recipient.

An impersonal gift, yet an intimate one.

The box includes a generous supply of letter sheets and cards, that may be monogrammed as an added touch, with envelopes of modish design.

The paper is Cordlinear, a new Crane creation, with smart "cord" effect, broken by self-tone vertical lines. The gift beautiful, artistically boxed and obtainable wherever good stationery is sold.



© '25
E.C.&P.CO.

At all stores where good stationery is sold

$5.00

EATON, CRANE & PIKE COMPANY, 225 Fifth Avenue, New York

to or from

CALIFORNIA

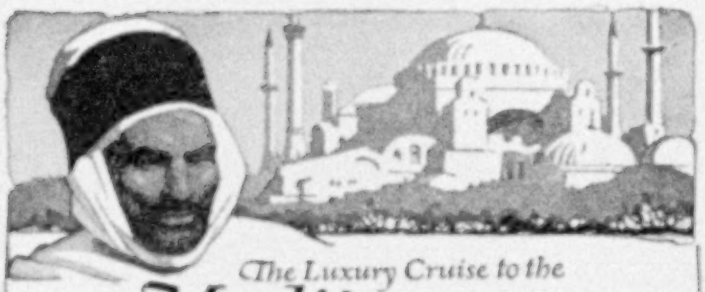
or the Northwest, take the interesting Adventure Land route through those regions rich in historic interest which are traversed by the

New Oriental Limited passing site of Old Fort Union on the boundary of North Dakota and Montana.

NEW ORIENTAL LIMITED

This is the finest train to the Pacific Northwest, specially Pullman equipped; de luxe features and service but no extra fare.

For information and free books, apply any Great Northern Railway office, any ticket or tourist agent or A. J. Dickinson, P. T. M., Great Northern Railway, St. Paul, Minn.



The Luxury Cruise to the

Mediterranean

PALESTINE — EGYPT

A pleasure cruise exceeding every expectation—Luxurious comfort, perfect service, enjoyable entertainment, on board the "Rotterdam." Scenic splendor, strange and thrilling sights in interesting Old World lands.

By the famous "ROTTERDAM" 5th Cruise

Leaving New York, Feb. 2, 1926

Under the HOLLAND AMERICA LINE'S own management

The "ROTTERDAM"

24,170 tons register, 37,190 tons displacement

Has a world-wide reputation for the magnificence and comfort of her appointments, the surpassing excellence of her cuisine and the high standards of service and management on board.

Sixty-seven Days of Delightful Diversion

ITINERARY includes Madeira, Lisbon, Cadiz, Seville, Gibraltar, Algiers, Tunis, Athens, Constantinople, the Holy Land and Egypt, Italy and the Riviera. Carefully planned Shore Excursions. Stopover in Europe.

Number of guests limited

American Express Co. Agents in Charge of Shore Excursions

For choice selection of accommodations make reservations NOW

Illustrated Folder "N" on request

HOLLAND AMERICA LINE

21-24 State Street, New York

Boston, Philadelphia, Pittsburgh, Chicago, Minneapolis, St. Louis, Detroit, Atlanta, Ga., Seattle, New Orleans, San Francisco, Mexico City, Montreal, Toronto, Winnipeg. Or any Steamship Agent.

Sunshine 360 Days A Year

Skies are always sunny in the Sunshine City. Only 82 sunless days in 15 years. And there's all kinds of fun for every sunny day. Swimming, boating or fishing in the Gulf and Tampa Bay. Golf, tennis, lawn bowling and every outdoor sport. Big League Baseball. Daily band concerts. Splendid accommodations. For booklet, address:

H. C. DILLMAN

Chamber of Commerce

St. Petersburg

Florida

The Sunshine City

If she had only known!
Like a thief in the night comes Pyorrhea
He pays the price of neglect
Thousands like her wait too long

4 out of 5 are victims

The fight against Pyorrhea is a fight against overwhelming odds. Statistics prove that four out of every five over 40 — and thousands younger, too — pay Pyorrhea's dreaded toll. Will you?

Be on your guard for signs of Pyorrhea

Just as the stability of a building is dependent upon its foundations, so healthy teeth depend upon healthy gums.

Bleeding gums are the first sign of Pyorrhea's approach. Then they begin to recede and the healthy pink color gives place to a pale, whitish tint. If this condition is not corrected, teeth are loosened, pus pockets form and often cause serious diseases.

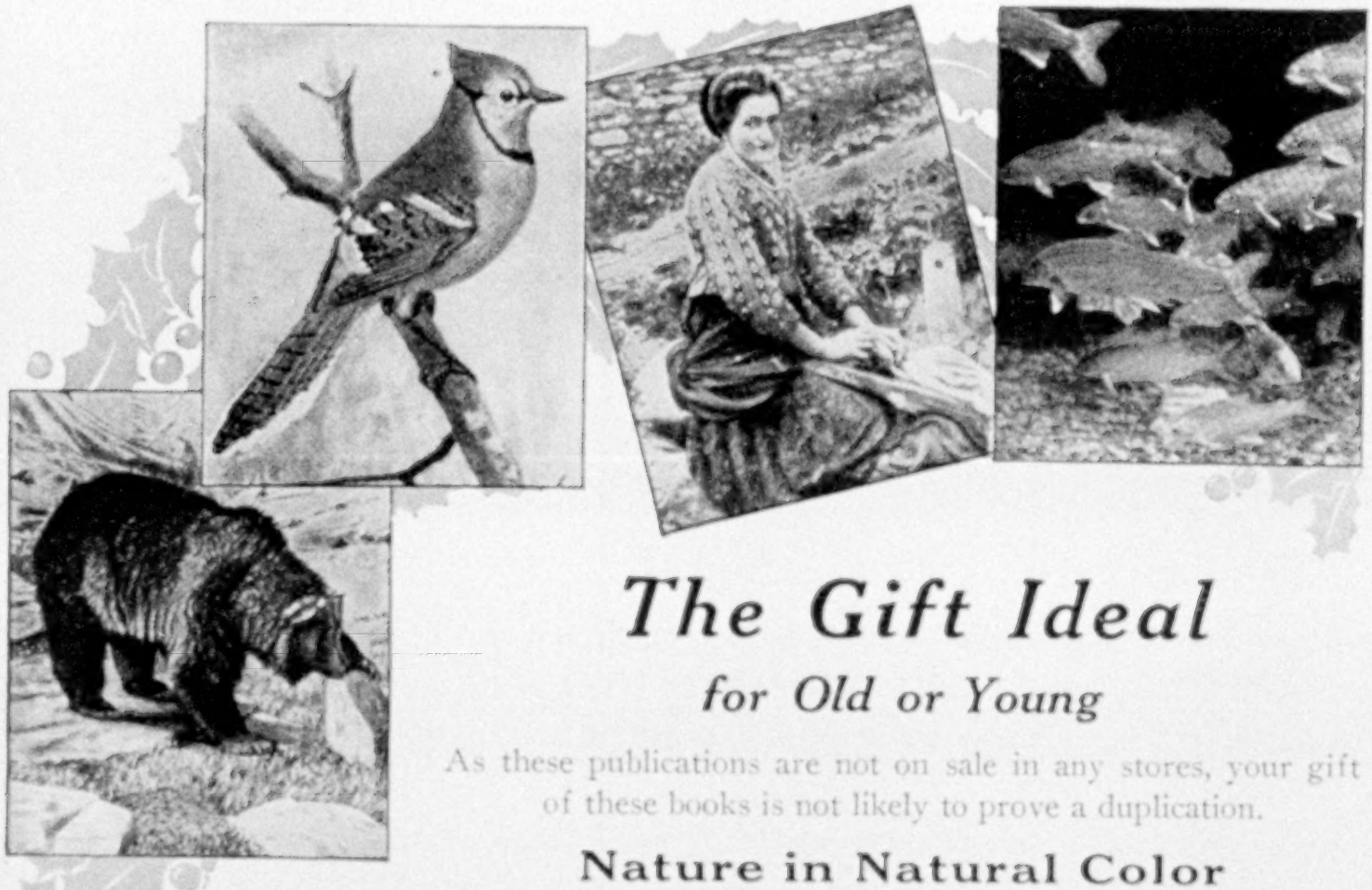
Forhan's For the Gums is a most effective agent in the fight against Pyorrhea. It contains just the right proportion of Forhan's Astringent (as used by the dental profession) to neutralize oral poisons, and keep the gums in a firm, strong, healthy condition. Also, it cleans and whitens the teeth and keeps the mouth sweet, clean and wholesome.

Just as the stability of a building is dependent upon a firm foundation, so are healthy teeth dependent upon healthy gums
Forhan's
FOR THE GUMS
"BRUSH YOUR TEETH WITH IT"
FORMULA OF
NEW YORK
Specialist in DISEASES OF THE MOUTH

Forhan's is more than a tooth paste; it helps to check Pyorrhea. Thousands have found it beneficial for years. For your own sake ask for Forhan's For the Gums. All druggists, 35c and 60c in tubes.

Formula of R. J. Forhan, D. D. S.
Forhan Company, New York

Forhan's
FOR THE GUMS



The Gift Ideal

for Old or Young

As these publications are not on sale in any stores, your gift of these books is not likely to prove a duplication.

Nature in Natural Color

The Book of Birds (Revised and Enlarged Edition, 1925)—by Henry W. Henshaw; Louis Agassiz Fuertes, portraits of 331 birds in full color; *216 pages; cloth, $3.*

The Book of Wild Flowers—by William J. Showalter and other authorities; full-color paintings of 250 wild flowers and grasses; *250 pages; Molloy-made art binding, $4.*

Wild Animals of North America—by Edward W. Nelson, Chief, U. S. Biological Survey; 127 full-color portraits by the famous naturalist-artist, Louis Agassiz Fuertes; 86 engravings; *240 pages; buckram, $3.*

The Book of Fishes—by John Oliver La Gorce and other authorities; underwater action portraits in full color of 92 fishes by Hashime Murayama; *244 pages; Molloy-made art binding, $4.*

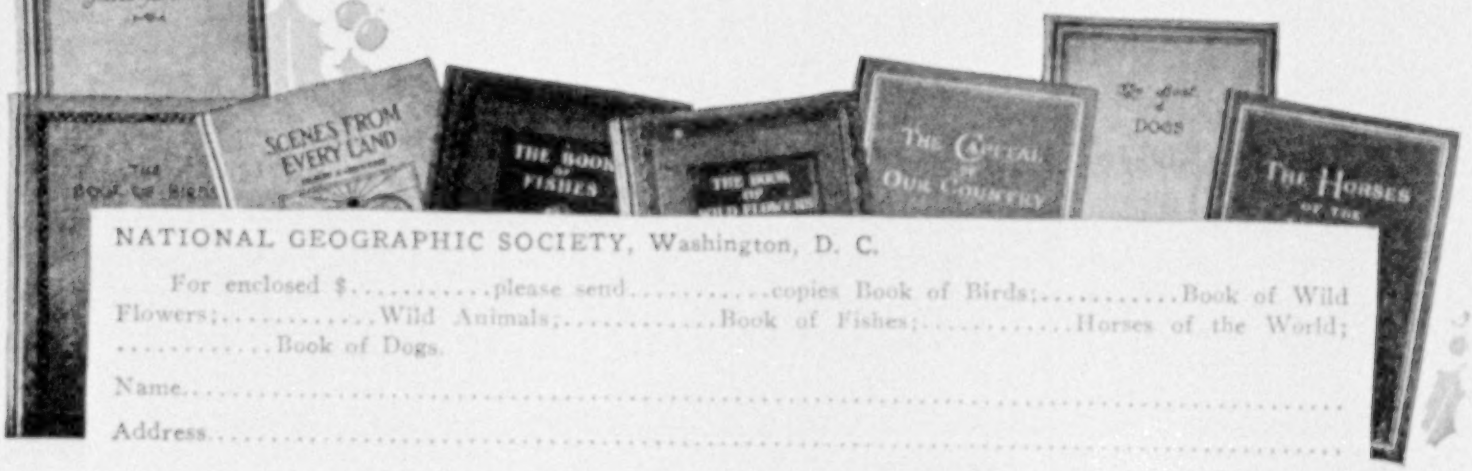
Horses of the World—by Major General William Harding Carter; 24 full-page illustrations in color by Edward Herbert Miner; 72 engravings; *110 pages; buckram, $3.*

The Book of Dogs—In this veritable "Bench Show" leading authorities discuss breeds of dogs and write of mankind's best friend; full-color portraits by Louis Agassiz Fuertes of 100 different dogs; *96 pages; buckram, $2.*

Prices postpaid in U. S. Foreign mailing, 25 cents each

Obtainable only from the

NATIONAL GEOGRAPHIC SOCIETY,
WASHINGTON, D. C.



NATIONAL GEOGRAPHIC SOCIETY, Washington, D. C.

For enclosed $.....please send.....copies Book of Birds;.....Book of Wild Flowers;.....Wild Animals;.....Book of Fishes;.....Horses of the World; .....Book of Dogs.

Name.....

Address.....

Quality — Service

EXTEND the life and service of your sheet metal work by using a more enduring material. It is a fact that an alloy of copper and steel gives greatest rust-resistance. The recognized leaders in the galvanized sheet world are

Apollo

BEST BLOOM — GALVANIZED SHEETS

APOLLO-KEYSTONE *Copper Steel* GALVANIZED SHEETS

FORMED ROOFING PRODUCTS

Apollo Galvanized Sheets, made continuously since 1884, are the best known Galvanized Sheets produced. An additional factor for permanence has been added in Apollo-Keystone grade by the use of Keystone Copper Steel for the base metal. This alloy steel is particularly adapted for roofing, siding, gutters, spouting, flumes, culverts, tanks, metal lath, and all sheet metal work requiring highest rust-resistance. Sold by leading metal merchants.

Write us relative to your requirements for Sheet and Tin Mill Products for all uses. We shall be pleased to assist the industry in the solution of its sheet metal problems. Send for our booklet "FACTS"—it will be of particular interest to you.

Sheet Mill Products

Black Sheets for all purposes, Apollo and Apollo-Keystone Copper Steel Galvanized Sheets, Culvert and Tank Stock, Formed Roofing and Siding Products, Special Sheets for Stamping, Automobile Sheets, Electrical Sheets, Stove and Range Sheets, Barrel and Keg Stock, etc.

Tin Mill Products

American Coke and American Charcoal Bright Tin Plates, Taggers Tin, American Old Style and American Numethodd Roofing Terne Plates, MF Roofing Tin Plates, Black Plate for all purposes; Enameling Stock, Stove Pipe and Elbow Stock, Special Stamping Stock, etc.

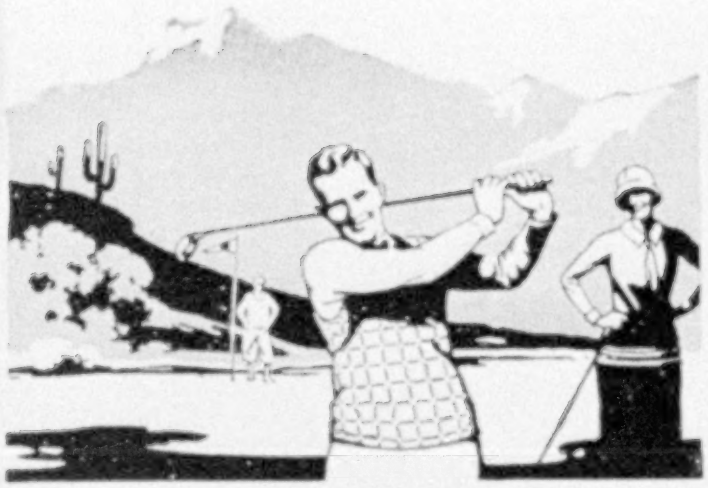
Manufactured by AMERICAN SHEET AND TIN PLATE COMPANY, *Pittsburgh, Pa.*

DISTRICT SALES OFFICES

Chicago Cincinnati Denver Detroit New Orleans New York Philadelphia Pittsburgh St. Louis

Export Representatives: UNITED STATES STEEL PRODUCTS CO., New York City

Pacific Coast Representatives: UNITED STATES STEEL PRODUCTS CO., San Francisco, Los Angeles, Portland, Seattle



SUNSHINE *and* HEALTH *await you here*

COME to Tucson for a few months—play or rest among the palms and flowers. Here's a land that's different; it offers you golden sunshine 336 days a year—and glowing health.

The Natural Way to Health

Play golf and tennis (Clubs open to visitors); ride horseback; motor through giant Sahuara Cactus forests; live on a real cattle ranch; camp, hunt—all under clear, blue skies.

Tucson's dry sunny air will freshen you up—fit you for another year of work. Come to Tucson if you are tired out, suffering from nerves or overwork, asthma or pulmonary troubles. You'll be surprised how soon your eyes sparkle with the joy of just living.

Lawns are now green; roses, zinnias and chrysanthemums are blooming. This sunny land, where winter is unknown, will give you the cordial welcome of the West.

Write for Free Book

Winter excursion rates now effective via Rock Island and Southern Pacific lines. Stop-overs on all tickets.

You will enjoy our illustrated book. Mail the coupon for it today.

TUCSON
Sunshine-Climate Club
ARIZONA

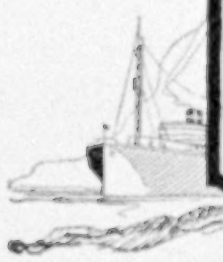
Tucson Sunshine-Climate Club,
504 Old Pueblo Bldg., Tucson, Arizona.
Please send me your free book, "Man-Building in the Sunshine-Climate."

*Name*_____

*Address*_____

116

The Island of Enchantment



PORTO RICO CRUISES

The glamour of Old-World cities, beautiful scenery and June-like climate. Interesting motor side trips without additional expense.

11 AND 12 DAYS

all expenses **$150** *and up*

Big, comfortable steamers (including new S. S. "Coamo," in service January, 1926) especially built for service in the Tropics. Weekly sailings. Wide range of accommodations.

CRUISE DEPARTMENT

PORTO RICO LINE

25 Broadway, New York City

EGYPT
SICILY, NORTH AFRICA, SPAIN

With Dr. George H. Allen
Small party sails from New York January 7, 1926

EGYPT
PALESTINE, SYRIA, GREECE, ITALY

Second Tour leaves New York January 16, 1926
Both tours include the cruise of the Lotus, our own private steamer on the Nile
Write for illustrated booklet

BUREAU OF UNIVERSITY TRAVEL

9 BOYD STREET NEWTON, MASS.

Pecans

Fresh, rich and wonderfully delicious are the pecans from Pecanway. Thin shells that can be cracked by hand and the meat extracted whole.

Fresh!

Direct to You by Mail

Pecanway Nuts are shade-cured for sweetness. Solid meat of the finest texture, free from all bitterness. Order a gift package today for yourself or friend. Money returned if not satisfied.

Reduced Facsimile

3-lb. Package, $3.50 **5-lb. Package, $5.50**

West of Mississippi add 50c for Postage

M. O. DANTZLER, N. Pecanway Place, Orangeburg, S. C.

Tiny pieces of platinum, saved from telephone apparatus no longer in service, are refined to be used again.

Saving labor, even in the task of salvaging waste. The lifting power of a magnet is here put to work, moving tons of scrap iron.

Cast iron
and platinum
—precious metals both!

If a pound of platinum is worth saving, why not a pound of scrap iron? This thought is the magic touchstone that makes even base metals precious at the Western Electric telephone factory.

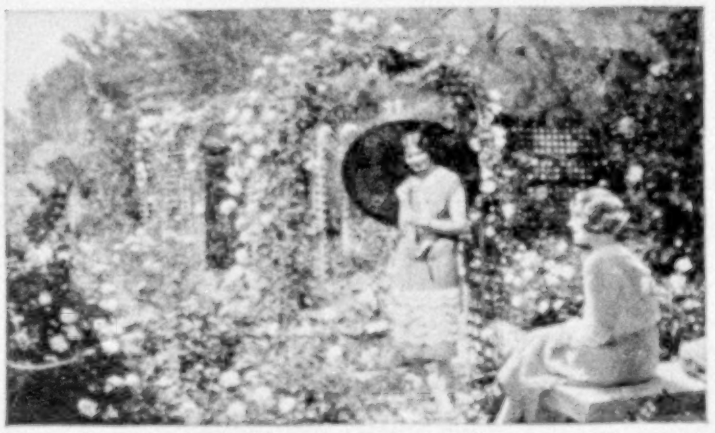
But here modern alchemy is only one part of a highly organized battle against waste. Lost time, false motions in manufacturing, inefficient ways yield one by one.

Nor is this the work of just a few years. Your telephone today stands as a symbol of progress because generations of Western Electric experience have helped to make it so.

Western Electric

SINCE 1869 MAKERS OF ELECTRICAL EQUIPMENT

Phoenix
ARIZONA



June Days *in Winter Months!*

SO many exciting things to do in the dry, sunny, winter days! You can go fishing—plan a hike to mountains—golf—browse around prehistoric remains—or drive to nearby scenic resorts. You will forget zero weather ever existed because blue skies and sunshine are practically continuous. No need to wrap up here! Flowers bloom in Phoenix while snow covers the East.

From Phoenix visit Roosevelt Dam, (over famous Apache Trail Highway), National Sahuara Park, flower-carpeted Arizona Desert—even as far as the Grand Canyon of the Colorado. Phoenix offers countless glorious open-air pastimes, on horse, foot, or by auto. See the wonderful Salt River Valley, reclaimed by irrigation, now a world beater in agricultural production.

Plan to visit Phoenix en route, or direct. Excellent hotels, stop-overs on Southern Pacific and Santa Fe railways and a personal welcome by the Club on your arrival.

Send for free book—a concise, impartial story for the convenience of visitors. Mail the coupon today.

14

Phoenix Arizona Club
504 Chamber of Commerce Bldg.,
Phoenix, Ariz.

Please send my copy of "*Phoenix, Where Winter Never Comes*," by return mail.

Name _____

Street _____

City _____

Opportunity Anchored in a Port of Pleasure

Greater Palm Beach (Palm Beach and West Palm Beach), the wonderful resort city—charming with her climate, beaches, motor drives, social brilliance, homes and estates—is likewise a city of commercial activity and opportunity. Year 'round population tripled in five years. Over $30,000,000 in new buildings now under way. Lake Worth being made into a great Atlantic harbor—millions to be spent. And the back country produces three and four valuable crops a year from the same land.

Write for beautiful illustrated booklet in four colors

Greater Palm Beach Chamber of Commerce
518 Chamber of Commerce Bldg.
West Palm Beach, Florida

SEE A MILE OR MORE

with Biascope. Magnifies 6 times. Light, practical, powerful. Made in America. At dealer or postpaid in leather case. WOLLENSAK OPTICAL CO., 815 Hudson Ave., Rochester, N. Y

$5
BIASCOPE

200 Sheets—100 Envelopes

$1.00
Post Paid

High grade, clear white bond paper—unusually smooth writing surface. Size 6x7 inches with envelopes to match. Has that crisp, crackly "feel" that identifies it to everyone as superior quality stationery.

Name and Address Printed Free

on every sheet and envelope in rich dark blue, up to 4 lines. Type is Plate Gothic, designed especially for clearness and good taste. Makes a personal stationery you will be delighted to use. An ideal gift with your friend's name. Attractive 3 letter monogram if preferred.

Just send $1.00 (west of Denver and outside U. S., $1.10) and this generous supply of stationery will come by return mail, postage prepaid. Securely packed in a sturdy blue box. Please write or print clearly. Prompt service and satisfaction guaranteed. Money refunded if you are not pleased in every way. Order today!

National Stationery Co., 1559 Lincoln Highway, Batavia, Illinois

Conrad Nagel,
Goldwyn Star.

Patrick DULUTH

Patrick Overcoats have Character!

Character is built right into them.

It shows in their very aristocratic lines, their faultless fit and skilled hand-tailoring.

Its foundation is the famous Patrick Cloth, noted for its rich texture, exclusive patterns and unusual wear.

Write for samples of this wonderful Cloth and interesting Overcoat Style Booklet, also name of nearest dealer. Address Desk G-22.

Other Patrick Products:

Sweaters and Sport Jackets
Flannel Shirts
Golf and other Hosiery
Leather Garments
Mackinaws
Blankets and Auto Robes

Excellent Quality

Our Two Brands

Three cloth weights—Heavy, Medium, Light.

Prices $25 to $85

Superlative Quality.

F. A. PATRICK & CO. DULUTH
Makers of both Cloth and Garment

"PURE NORTHERN WOOL
from sheep that thrive in the snow"

MILITARY

BINOCULARS
French and German

6 and 8 POWER $19.50 POSTPAID

Leather case and carrying straps included

A PRACTICAL CHRISTMAS GIFT

A BARGAIN for those wishing best prismatic binocular with highest quality lenses. This type usually quoted at $40 to $50. Made by leading French and German manufacturers to strict military specifications, where quality counts, not price. 65,000 binoculars sold, and as we are direct importers we eliminate jobbers' profits. Many glasses received direct from Allied Reparations Commission. All are guaranteed. Wide angle models—6 and 8 power—day and night lenses. High luminosity—achromatic objectives—excellent definition.—pupillary adjustment—dust and moisture proof. Approved for U. S. Army Officers. For races, hunting, bird study, astronomical observations, or ocean travel.

Glasses will be shipped promptly, complete with leather case and straps, upon receipt of check or money order for $19.50, with positive guarantee of full cash refund for any glasses returned.

Order Your Military Binoculars Today

HENDERSON BROTHERS

Largest importers of field glasses in America

91 Federal Street **Boston, Mass.**

LINCOLN LOGS

$1 - $2 - $3
Delivered

The Building Material of our Forefathers

LINCOLN LOGS—For Christmas Gifts — Play things that typify *"The Spirit of America."* Our Design Book shows how to build *"Lincoln's Log Cabin" "Valley Forge" "The Log Meeting House"* and other historic buildings. Girls can build houses, chairs, tables, etc., for their dolls. Boys build bridges, block houses, farm buildings, fences, in fact all forms of log construction.

TRIPLE SET of 165 logs, 2 roofs chimney and Design Book, delivered $3
DOUBLE SET of 107 logs, roof, chimney and Design Book, delivered $2
SINGLE SET, 50 logs, roof and Design Book, delivered $1

SEE YOUR DEALER OR MAIL COUPON EARLY

JOHN LLOYD WRIGHT, Inc.
Room 179, 234 E. Erie St., Chicago, Ill.

Please mail at once, postage prepaid:

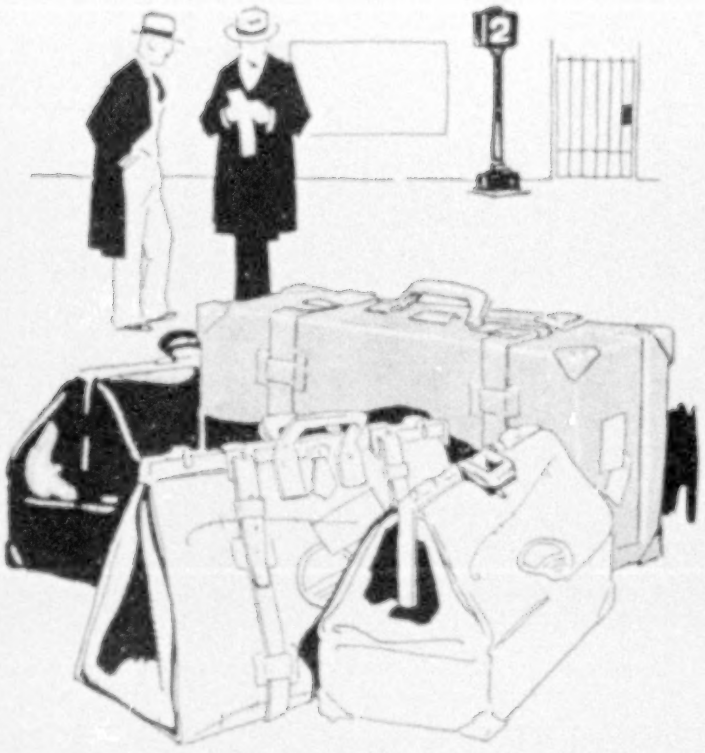
☐ Triple Sets of 165 Logs $3 ☐ Double Sets $2 ☐ Single Sets $1

Enclosed is $ . . . . for Logs specified. It is understood you will refund money if I should return them after 5 days.

Name _____

Street or R. F. D. _____

City _____ *State* _____



THE experienced traveler carries Baggage Insurance regardless of the length of the trip.

North America Tourist Baggage Insurance costs very little and is readily obtained from any Agent.

Mail the attached coupon for further information.

Insurance Company of North America

PHILADELPHIA

"The Oldest American Fire and Marine Insurance Company"

Founded 1792

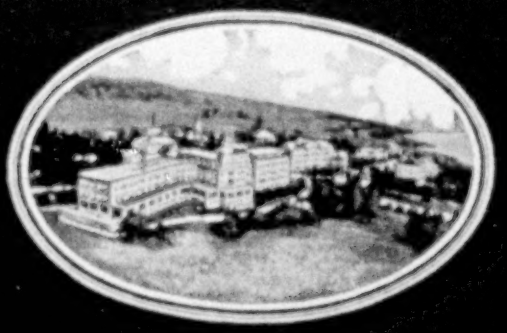
Insurance Company of North America
Third and Walnut Streets
Philadelphia, Pa., Dept. GG12

Name .....

Street .....

City ..... State .....

Wants information on Tourist Baggage Insurance



THE GLEN SPRINGS

WATKINS GLEN, N.Y.
ON SENECA LAKE

Open All Year *Wm. E. Leffingwell, Pres.*

A Health Resort and Hotel with complete facilities for the treatment of heart, circulatory, digestive and nervous disorders. Valuable mineral springs—highly radio-active. Baths under specialized medical direction. Illustrated booklets on request.

CLARK'S FAMOUS CRUISES

By Cunard line, new oil burners

JAN. 20, AROUND THE WORLD CRUISE
westward; 128 days, $1250 to $3000.
Featuring 26 days Japan and China, including Peking.

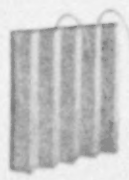
JAN. 30, MEDITERRANEAN CRUISE
62 days, $600 to $1700.
Featuring 15 days Palestine and Egypt.

JUNE 30, 1926, NORWAY
and Western Mediterranean; 53 days, $550 to $1250.

Rates include hotels, drives, guides, fees. Originator of Around the World Cruises. Longest experienced cruise management. Established 30 years.

F. C. CLARK . . Times Building, New York

SAVO AIR MOISTENER



Saves Health, Furniture, Pianos, Fuel, Paintings, Plants, etc.

Fill with water, hang on back of any Radiator out of sight. Others for all types of Hot Air Furnaces. Tens of thousands in satisfactory use. $1.50 to $3, According to size. *Write for FREE BOOKLET.*

SAVO MANUFACTURING COMPANY
Dept. W-12
111 W. Monroe Street, Chicago, Ill.

SAVO All-Year-Around Steel Flower Box

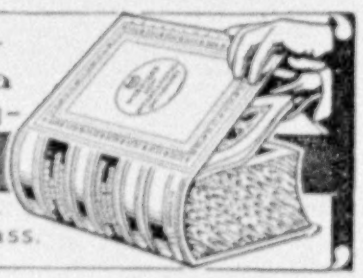
GROW LARGER, STRONGER HEALTHIER PLANTS

Self-watering and sub-irrigating steel boxes for windows, porches, ledges, sun parlors, etc. Leak proof; rust proof. Perfect air circulation and drainage. Six sizes. Write for FREE catalog.

SAVO MANUFACTURING CO., Dept. B-12
111 W. Monroe Street, Chicago

Whatever Your Question;—be it the pronunciation of Fascista, the spelling of a puzzling word, the location of Esthonia the meaning of soviet, realtor, vitamin, etc., this Supreme Authority—

WEBSTER'S NEW INTERNATIONAL DICTIONARY



contains an accurate, final answer. 407,000 Words. 2700 Pages. 6000 Illustrations.
Regular and India-Paper Editions
G. & C. MERRIAM CO., Springfield, Mass.
Write for specimen pages, prices, etc., and FREE Pocket Maps per Geographic

A Very Special Offer of Four Genuine COWAN Christmas Presents

COWAN Martha Washington Sewing Table

Reproducing the famous original in Mt. Vernon. "It's a beauty; I'm proud of it as can be," says Miss M. E. C. of Attleboro Falls, Mass. And so say 50,000 other women!

Genuine Mahogany, beautiful finish; 29 in. high; 27 in. wide; 14 in. deep; sliding needle tray in top drawer; spool rods in second; deep pockets each side. **Made only by COWAN, Chicago.**

Now offered the first time on easy payments. Pin $1 (bill or check) to your order and pay balance of $26.50 at $4 a month. 10 pct. discount for cash. Delivery free anywhere in U.S. **Money back within 30 days if not perfectly satisfied. FREE** booklet on request.

The COWAN Drop-Leaf Table

For Living or Breakfast Room. Takes little space when not being used. Seats six comfortably when leaves are raised. For well-furnished apartments where smaller furniture is desirable.

Combination Gum Wood, Mahogany top; and end drawer. Masterful make, beautiful finish; closed size; 12" x 29". Opens to 29" x 45"; 30" high. Send only $1. Balance $33.50 on **easy payments, $4** a month. 10 pct. discount for cash. Delivery charges prepaid. Return in 30 days, if not delighted, for full refund of your money. **FREE** descriptive circular.

The COWAN Cane Chair

Your Living Room has not complete "finish" without this most comfortable, good-looking piece of furniture. Large and roomy; made of genuine solid Mahogany throughout, with cane seat and back. Truly a masterpiece of chair-making craftsmanship. And a value whose equal you won't find anywhere. Only $31.50 on easy payments. Rocker to match (if desired) at the same low price.

Comes to you, **transportation charges prepaid,** for $1.00. The rest of payment in monthly installments of only $4.00. 10 pct. discount for cash. If not satisfied, return to us within 30 days at our expense, and your money will be promptly refunded. **FREE** catalog tells all about it.

The COWAN Tea Wagon

A beauty, and useful, too! All genuine Mahogany or solid Walnut as desired. Removable glass tray and rubber-tired wheels with casters. Drop-leaves on both sides make a large table when raised. Takes little space when not in use. 17 1-2" x 27"; 28" high.

Ideal as a gift or for yourself. Send only $1. Pay the balance of $41.50 in small installments of $4 a month. 10 pct. discount for cash. **We pay delivery.** If not even more than expected, return within 30 days for a refund of your $1 deposit. Descriptive folders sent **FREE.**

COWAN CABINET COMPANY

837 Rush Street — Chicago, Ill.

Which?

Mock coffee or real coffee without the caffeine

Countless people are forced to coffee substitutes. Others must stint on coffee. Others must omit it at night.

All because of a drug—caffeine. The average coffee contains 2½ grains per cup. It affects the heart, nerves and kidneys.

Now there's a coffee called Kaffee Hag, with the caffeine taken out. We open the pores and extract it, but we leave every coffee joy.

The result is an exquisite coffee, rich in flavor and aroma. Many fine hotels now serve it. In countless homes it is the favorite brand.

Nobody can tell that the caffeine is removed. Not even expert tasters. Caffeine is a tasteless drug. Even its stimulation is not missed.

So Kaffee Hag offers you and yours fine coffee at its best. The flavor and aroma are intact. The quick bracing effects remain. But all can drink that coffee at all hours with never a thought of harm.

If someone at your table would like such a coffee, let us send you a package to try. Only 10 cents with this coupon. (Stamps will do.)

KAFFEE HAG

1467 Davenport Ave. — **Cleveland, Ohio**

Mail This Today for 10-Cup Sample; 10 cts.!

KAFFEE HAG

1467 Davenport Ave.
Cleveland, Ohio

Name _____

Address _____

GERMAN ARMY OFFICERS' FIELD GLASSES

FREE TRIAL

8 power **$9.85** If you wish to keep them

Free trial coupon will bring you these genuine German War Glasses purchased at exceptionally advantageous rates of exchange.

Manufactured by most prominent of German optical factories. Many were received direct from the Allied Reparations Commission. Conservative $20.00 value. A most appropriate Christmas gift.

Finest achromatic day and night lenses. 40 m. m. objective. Dust and moisture proof. Pupillary adjustment. Built for service, regardless of cost, according to strictest military standards. All glasses guaranteed in perfect condition. We have sold 80,000 pairs of this model to date.

Shipped promptly on receipt of attached coupon on 5 days' free trial. If satisfied send check or money order for $9.85. *Order your field glasses today.*

HENDERSON BROTHERS

Largest importers of field glasses in America

97 Federal Street Boston, Mass.

FREE TRIAL COUPON

Gentlemen:

Please send me on 5 days' free trial one pair German Army Officers' war glasses. After 5 days' trial I will either return glasses or remit $9.85.

Name .....

Address .....

State .....

GEO. 2

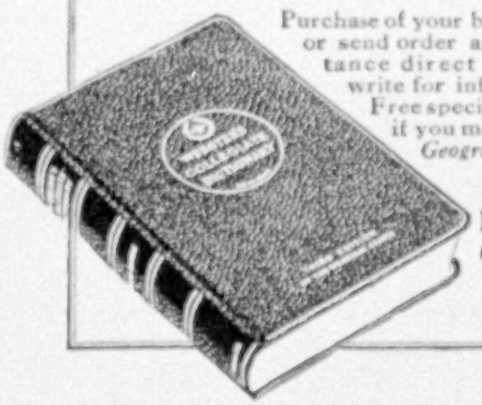
For Christmas

The Treasured Gift

WEBSTER'S COLLEGIATE DICTIONARY

—the best abridged dictionary. It is based upon Webster's New International. 106,000 **Vocabulary** terms; dictionary of **Biography; Gazetteer;** rules of **punctuation,** use of **capitals, abbreviations; foreign phrases;** etc. 1256 pages; 1700 **illustrations.**

The thin-paper edition is especially handsome and convenient to handle. Art Canvas binding $5.00; Fabrikoid, $6.00; Leather, $7.50.



Purchase of your bookseller; or send order and remittance direct to us; or write for information. Free specimen pages if you mention *The Geographic.*

G. & C. MERRIAM COMPANY

Springfield, Mass.

Therm-o-Dial

THE ART THERMOMETER

The aristocrat of Christmas gifts—registers temperature plainly as a speedometer does speed.

GOLF MODEL (as illustrated), 6¾ inches high, **$7.50**

Other Models for home or office include: Beehive, Nursery, Bell, Indian, Monkey and Fleur-de-Lis, in antique, bronze, brown or green gold, $4 to $10.

At dealers or by mail.

Send for Illustrated Booklet

THERM-O-DIAL LABORATORIES

129 Sussex Avenue Newark, N. J.

Keep your back numbers serviceable and complete—a pride to any home. A record is kept of every binding and can be duplicated each year.

Bind Your Geographics

the right way—the right kind of sewing to give the strength and flexibility to permit flat opening. This is the way I have bound them for thousands of subscribers, in almost every State. I can supply missing numbers. Bind all other periodicals and complete libraries. *All work guaranteed.*

Send for booklet describing styles and prices.

H. KAUFMAN

Library Bookbinder

Established 1903

217 E. 38th Street

New York City

THIS MAGAZINE IS FROM OUR PRESSES

JUDD & DETWEILER, INC.

Master Printers

ECKINGTON PLACE AND FLORIDA AVENUE WASHINGTON, D. C.

Give him a Thermo

Coat & Knickers
$20.00

REG. IN U.S. PAT. OFF.

Thermo
Knitted Coats Vests & Knickers

THE outstanding gifts for any man—Thermo sport coats, knickers or vests to match, as you wish.

No matter which you buy, the wearer will be more than pleased, because Thermo can be worn the year 'round.

Quality is assured, for every Thermo garment is *guaranteed all virgin wool.* Many wearers have had from two to six years' service from Thermo garments, and they are still good for longer wear.

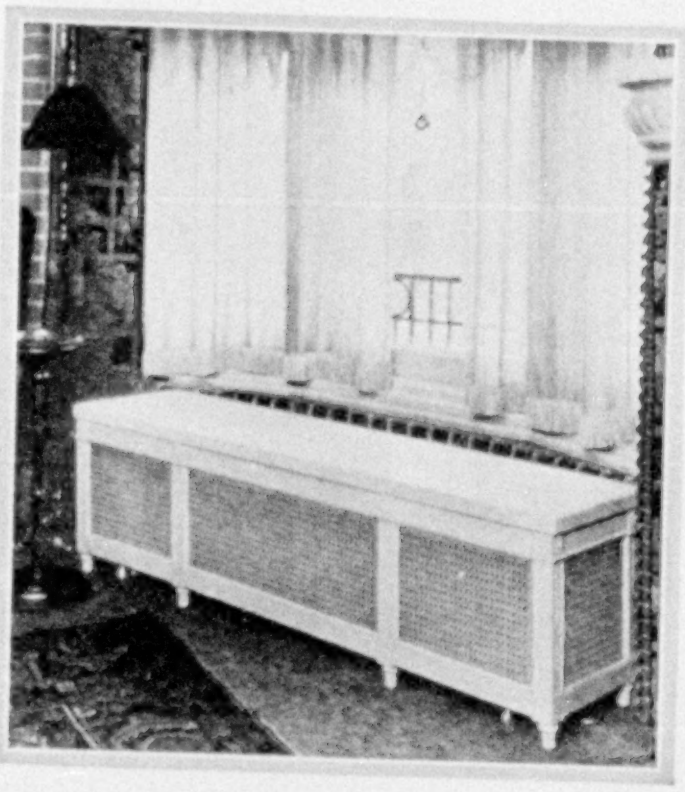
Thermo knickers, coats and vests are obtainable in a variety of colors, including the latest popular shades, to suit all tastes.

Be sure to look for the Thermo hanger in each garment. If your dealer cannot supply you, write us and we will see that you are supplied in time for Christmas.

THERMO MILLS, INC.
345 Broadway, Dept. N
New York

From Sheep's Back To Yours

SLYKER
METAL
Radiator Furniture



EVERY home owner enthuses over the beauty of SLYKER Radiator Furniture. But attractiveness is only one admired feature. It also prevents the costly soiling of delicate draperies and walls, and keeps heated air moist, comfortable, healthful. A patented humidifier under top serves this double purpose. Your radiators are entirely concealed in artistic cabinets, without loss of heating efficiency. Made entirely of Furniture Steel, finished in six coats of oil enamel, baked on. You have choice of three styles. Cane Grille is pictured. Finishes in shades of Mahogany, Walnut, Ivory or White—to harmonize with your room decorations. Converts radiators into useful seats or consoles.

Write us for name of nearest dealer where samples may be seen. We will send you descriptive book in colors upon request.

SCHLEICHER, *Inc.*
Dept. 30
GARY, INDIANA

Hear Ye! Hear Ye!

LOVERS OF COFFEE

THE COFFEE PROBLEM IS SOLVED!

A CUP OF HOT WATER, ONE TEASPOONFUL OF

Washington's

DELICIOUS INSTANT COFFEE

SUGAR AND CREAM TO TASTE.

EACH CUP TO ORDER AT TIME OF SERVICE

WITHOUT TROUBLE OR FAILURE.

UNIFORM QUALITY GUARANTEED

Send 10c for Special Trial Size Recipe Booklet Free

G. WASHINGTON COFFEE REFINING CO. 76 Varick Street, New York

DUES

Annual membership in U. S., $3.00; annual membership abroad, $4.00; Canada, $3.50; life membership, $100. Please make remittances payable to the National Geographic Society, and if at a distance remit by New York draft, postal or express order.

RECOMMENDATION FOR MEMBERSHIP

IN THE

NATIONAL GEOGRAPHIC SOCIETY

The Membership Fee Includes Subscription to the National Geographic Magazine

PLEASE DETACH AND FILL IN BLANK BELOW AND SEND TO THE SECRETARY

.....192

To the Secretary, National Geographic Society,
Sixteenth and M Streets Northwest, Washington, D. C.:

I nominate .....

Occupation .....
(This information is important for the records.)

Address .....

.....

for membership in the Society.

.....

.....
Name and Address of Nominating Member

12-25

A Good Bookcase
for the price of a good book!

$3.00 Per Section without Doors

With Disappearing Glass Doors —— **$3.75** Per Section

On Approval~Direct to User

Lundstrom
IT GROWS WITH YOUR LIBRARY

SECTIONAL BOOKCASE

Endorsed by Over 100,000 Users

Made for and universally used in the finest homes and offices throughout the country. Made in sections of different sizes, combining utility, economy and attractive appearance. Price complete as shown above, with top, base and three book sections with **non-binding, disappearing, felt-cushioned** glass doors, beautifully finished in plain golden oak, $15.75; without doors, $13.50. In quartered oak, or in imitation mahogany, with doors, $18.25. In genuine mahogany, with doors, $23.50. Other styles at correspondingly low prices. **Shipped direct from factory** ON APPROVAL at a considerable saving TO YOU Write for catalog No. 80.

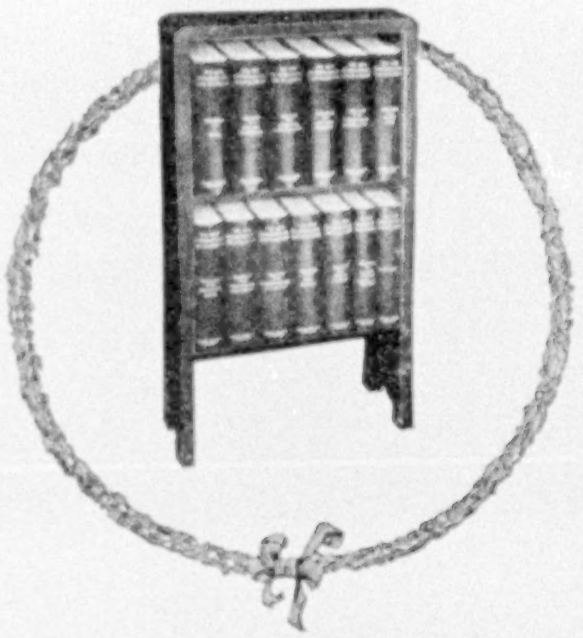
The C. J. LUNDSTROM MFG. CO., Little Falls, N. Y.
Manufacturers of Sectional Bookcases since 1899

Monthly Cruises from New York

California
via Spanish Americas

Days of pure delight on balmy seas, with two days crammed full of interest at Panama Canal and eight never-to-be-forgotten visits in Colombia, Nicaragua, Salvador, Guatemala and Mexico, thence to Los Angeles and San Francisco. Oil-burning steamers especially built for the tropics, highest standards of efficiency, all outside rooms, beds not berths, cabins deluxe, lounges, broad open decks, music, excellent cuisine. Cruise Fares $295.00 up. *Monthly cruises also from San Francisco and Los Angeles via "Spanish Americas" to New York.* Write for Booklet N.

PANAMA MAIL LINE
NEW YORK 10 *Hanover Sq.*
SAN FRANCISCO 2 *Pine St.*
LOS ANGELES 903 *So. Spring St.*



In Your Home This Christmas.—A Gift for All the Family

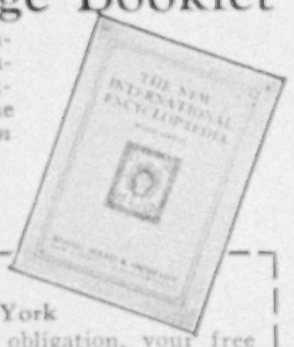
The New Popular-Priced Edition of

THE NEW INTERNATIONAL ENCYCLOPAEDIA

For this Christmas what a satisfying gift would be The New International in its New 13-volume Popular-Priced Edition—identical to the regular 25-volume edition as to contents—but offered in this new form at an amazing saving in cost. Now the consideration of price need not stand between you and your first choice in reference works. Here is America's own encyclopædia—the world's greatest treasury of knowledge—at a price within reach of everyone and on terms amounting to only a few cents a day.

FREE—64-Page Booklet

with specimen pages, illustrations, etc., and full information about the regular 25-volume edition and also the new *Popular-Priced Edition* in 13 volumes.



Mail This Coupon

DODD, MEAD & CO.,
449 Fourth Avenue, New York

Send me, without cost or obligation, your free 64-page booklet and full information about The New International Encyclopædia and the new *Popular-Priced Edition.* (Geographic 12-25)

Name_____

Address_____

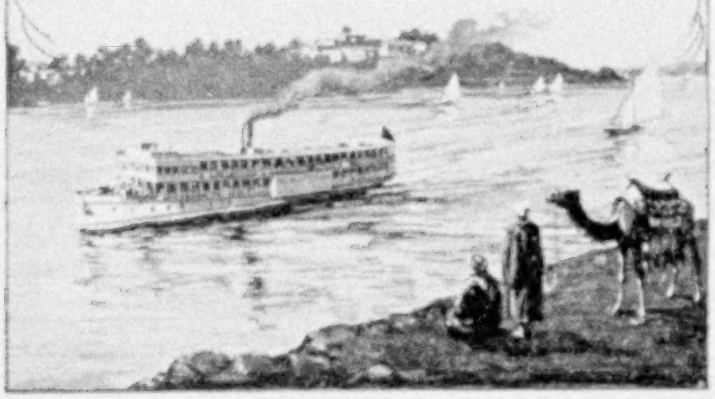
The NILE *is Egypt!*

The meaning of Egypt, its greatness, its romance, its magic and beauty cannot be appreciated or understood except by voyaging on its wonderful water-way.

Our Nile steamers and Dahabeahs offer the utmost in comfort and luxury for just such a voyage.

Regular sailings from Cairo to the First and Second Cataracts.

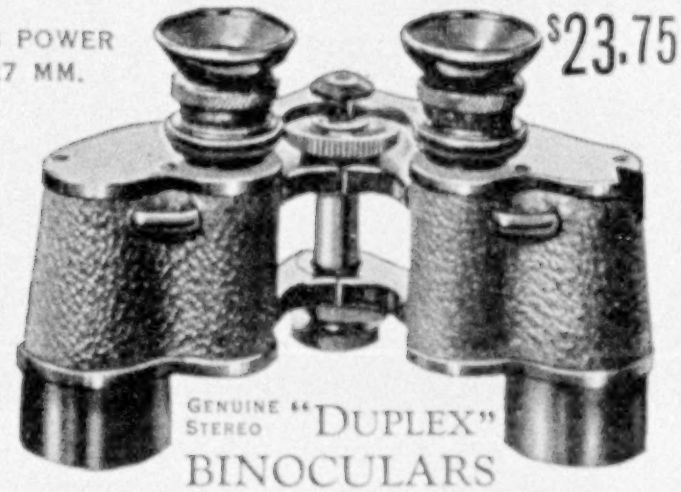
THOS. COOK & SON



The Gift of Gifts

8 POWER
27 MM.

$23.75



GENUINE STEREO "DUPLEX"
BINOCULARS

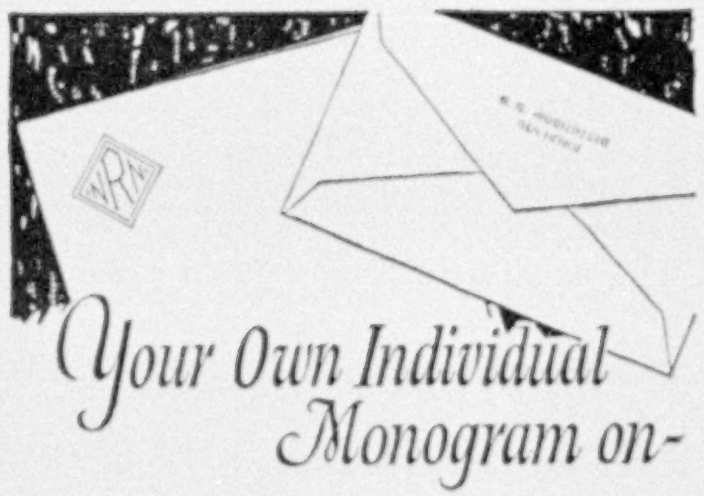
A pair of the famous Duplex 8 power 27 mm. objective lenses Stereo Prism Binoculars will make a suitable gift for any member of the family. Made by G. Rodenstock, Munich, Germany. Fully tested and guaranteed to equal domestic glasses selling for much more.

Compact and powerful—unsurpassed illumination—wide range of vision. Prisms cannot get out of alignment—sharp, needle-point definition. Duplex Binoculars will make an unusual, appreciated gift long to be remembered by the recipient.

Every pair sold with unconditional guarantee to be exactly as represented or money refunded.

Sent postpaid complete with leather case and shoulder strap on receipt of check or money order for $23.75. Descriptive circular on request.

ARMY AND NAVY SUPPLY CO.
243 West 42nd Street New York City
Sole U. S. Distributors of Duplex Binoculars



Your Own Individual Monogram on-

100 Double (folded) Sheets and your address on 100 Envelopes $2.50

THIS must not be confused with ordinary printed paper. My "Cameo" Process (patented) has all the rich and distinctive appearance of expensive Die engraving, with an added depth and luster that is exquisite. Extra-heavy paper, semi-parchment finish, bearing my water-mark. My Guarantee: If you are not satisfied, your money returned and you may keep the paper. In business since 1914.

Paper Colors—White, Sand, Light Gray, Orchid, Blue
Marking Colors—Blue, Black, Brown, Jade Green, Gold

Envelopes may be blank, or have 1, 2, or 3 line address stamped on flap. With name and address *only* on paper and envelopes, $2.00. Write plainly. Print initals in order wanted.

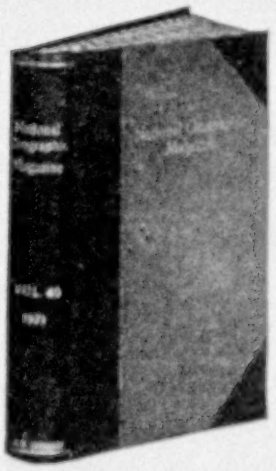
West of Mississippi add 20 cents. Send currency, check or money order.

Wallace Brown, 223 Fifth Avenue, New York

Save Your NATIONAL GEOGRAPHIC MAGAZINES

Let Us Bind Them for You NOW

It's worth while—It s our specialty—It costs little



We don't have to tell you how interesting and valuable they are. You as a member know that now. Then why let them be torn, scattered and lost, when our handsome, permanent binding, that admits the easy opening of every page, will make them into wonderful volumes for your library—of ever fresh and lasting interest to you, your children and your grandchildren?

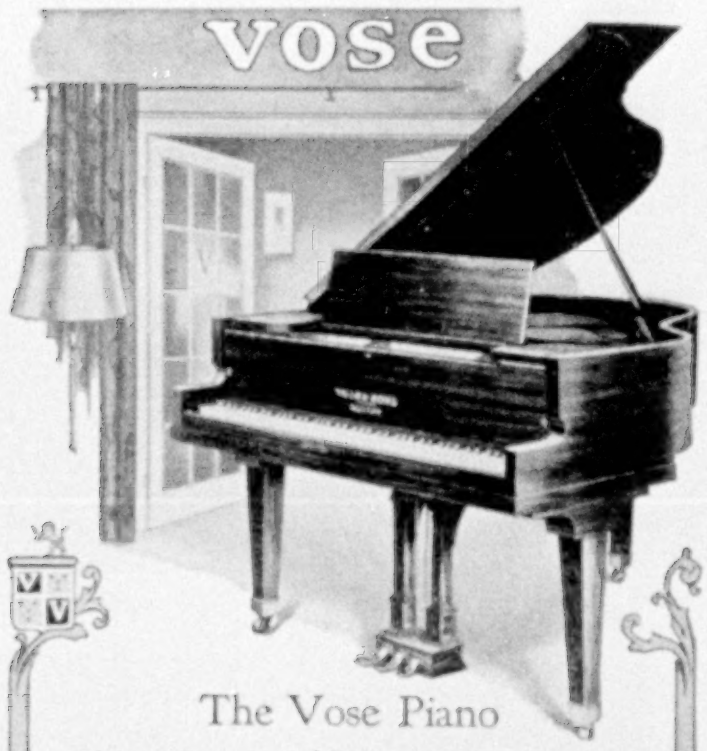
Thousands of National Geographic Members Have Us Bind THEIR Copies Every Year

Why not start *now* and let us bind *yours?* Missing back numbers supplied at reasonable prices; indices for each volume furnished free.

Write for free booklet, illustrating in colors different styles of binding and giving prices and shipping instructions. All work guaranteed. Try to write us Today.

Burgmeier Book Bindery

Incorporated
BOOK BINDING OF EVERY SORT
1855-1861 Milwaukee Ave., Chicago, Illinois



The Vose Piano

with its incomparable tone, its magnificent construction insuring permanency of tonal qualities, represents the supreme culmination of over 70 years of scientific research and experience, and yet the price is moderate.

WE CHALLENGE COMPARISON

Write for illustrated catalog and easy monthly terms of payment.

Vose & Sons Piano Co., 146 Boylston St., Boston

Onoto the Ink Pencil

A Gift Unusual and Useful

An Onoto with its ease of writing will be a lifelong delight to its owner. Simple as a pencil, but writes with ink. Non-leakable, no matter how carried. In two sizes, long or short, in either black or red.

Price, $3; with nickel clip . . $3.25
With gold-filled top and ring $4.00
With solid gold top and ring $7.50
With two solid 18-kt. gold bands $12.00
Completely covered with solid gold $25.00

Write for literature and names of dealers near you.

THOMAS DE LA RUE & CO., Ltd.
450 Fourth Ave., New York

No ink is quite so good as Onoto Ink!

Health Sunshine Opportunity

A WINTER'S morning! — yet you are irresistibly drawn outdoors by soft, dry sunshine—by the perfume of flowers—by the lazy drone of honey bees. This is El Paso.

Imagine a place where fog and snow are unknown! Where you can live outdoors all year long! Where you are constantly invigorated by a moderate altitude and almost continuous summer weather. That's El Paso, too!

A new modern city, of unusual educational facilities and of boundless opportunities for business, farming and professional work! Where population doubles every ten years! Where to live is to take a new lease of life in health and happiness! This is what El Paso offers!

6 cents to Old Mexico

Send for Booklet

Mail the coupon for *"Filling the Sunshine Prescription"* an illustrated, accurate, impartial story of the climate, health, and prosperity which we offer you. Old Mexico — *Bohemian Juarez!* — is only 6¢ distant.

Free, 10-day stop-over to El Paso allowed on all railways. Write today.

El Paso ★ Gateway Club TEXAS

GATEWAY CLUB
504 Chamber of Commerce Bldg.,
El Paso, Texas.

Please send me the free booklet, *"The Sunshine Prescription."*

Name _____

Address _____

89

Gifts De Luxe

Carry the joy of Christmas through the year! Give a De Luxe Gift Box of Patrician Pecans—the largest of the very finest pecans, size shown by illustration, with thin shells, easily opened without a nut-cracker. Large luscious kernels, full of nutriment, easily removed whole. Delicious in flavor as choicest confections. Nature's finest food, rich in protein, fat, minerals, and vitamines.

Wonderful New Book
"800 Proved Pecan Recipes"

shows economical, practical recipes for staple use of pecans throughout the year to assure health and vigor. Wonderful Pecan Christmas dainties—Plum Pudding; Pumpkin, Mince and Cranberry Pie; Pecan Fruit Cake, Christmas Cake and Cookies. Remarkable salads, sandwiches, breads, sweet breads, entrees, and combinations with vegetables included. The cream of over 21,000 favorite pecan recipes of 5,083 women; tested by expert dietitians.

Menus for every meal at various seasons showing how to assure balanced diet. 460 pages; 85 photographic illustrations, including color plates. In Durable, Washable Binding $2.50, postpaid.

ELAM G. HESS
Keystone Pecan Research Lab,
Box 406, Manheim, Pa.

Patrician Pecans

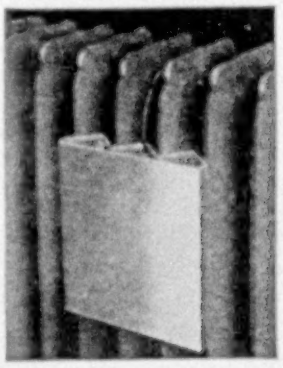
are the finest nuts I ever saw," wrote Dr. Kellogg, head of the famous Battle Creek Sanitarium.

Send Me $1.50 Today and I will send you postpaid a beautiful 12-oz. Gift Box of Patrician Pecans, fresh from the orchard.

GUARANTEE

Eat six at my risk; if dissatisfied return balance within 10 days and get your $1.50 back. 10-lb. family carton $15.00. Price list of other fine pecans, 70c lb. up, on request.

INDOOR DESERTS!



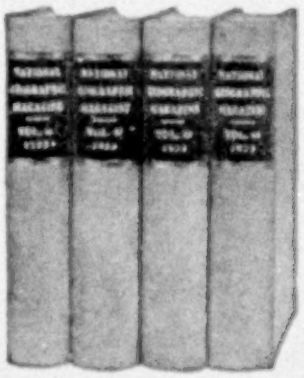
The air in many heated homes contains less moisture than that of the Sahara Desert. This dry, hot air causes colds, throat and lung troubles. Delbrook Air Moisteners automatically maintain the humidity necessary to health.

Send for circular.

Price, $5.00 for Four
PREPAID
$5.25 West of the Mississippi

DELBROOK VENTILATING CO.
Dept. 2-N 25 Common Street, Boston, Mass.

Bind Your National Geographics



Let Us Start a Handsome Library For You

Retain this valuable publication as a permanent reference.

Send Them To Us!

Have them artistically bound in best quality library buckram, any color.

30 years' experience assures entire satisfaction. Special low price of $1.50 per volume containing 6 issues.

Write for samples of materials. No obligation.

We also handle all types of miscellaneous binding.

THE BOOK SHOP BINDERY
350-354 W. Erie St. Chicago, Illinois

Ideal Wall Decorations—
Photographs Displayed
With

Moore Push-Pins

Glass Heads—Steel Points

Safeguard your heavy framed pictures by using

Moore Push-less Hangers

"The Hanger with the Twist"
Scientifically Secure Safety

Tool-tempered steel points insure safety and will not injure plaster or woodwork.

10c. Pkts. Everywhere

Moore Push-Pin Co., Philadelphia, Pa.
Manufacturers of Colored Map Tacks

Clearwater

Florida West Coast—On the Gulf

Where "It's Springtime All the Time"
Revel all winter in the great outdoors in an always delightful climate. Countless diversions and wonderful investment opportunities.

Sporty golf on 18-hole courses—grass greens. Finest Beach on West Coast. Fishing, Motoring, Lawn Bowling, Tennis, Roque, Big League Ball, Daily Band Concerts. Attractive accommodations.

Highest Elevation on Either Coast
Handsome, illustrated booklet or any desired information sent free on request. Address

CLEARWATER CHAMBER OF COMMERCE
Dept. 10, Clearwater, Florida

OWN A BAROMETER

and Foretell the Weather

This reliable Barometer enables you to predict accurately any change in weather 8 to 24 hours in advance. Scientifically constructed, attractive in appearance. Highly polished mahogany case, silvered metal dial, heavy bevel glass front. Size 5½ inches.

AN IDEAL GIFT

Makes a highly prized and lasting gift. Educational, useful and interesting. Indispensable to motorists. Should be in every home. Fully guaranteed; postpaid to any address on receipt of **$5.00**

DAVID WHITE, Dept. 110, 419 E. Water Street
Milwaukee, Wisconsin

Unique Holiday Greetings

INSTEAD of ordinary cards, order for your friends the beautiful Geographic panoramas—lovely photogravures large enough for framing.

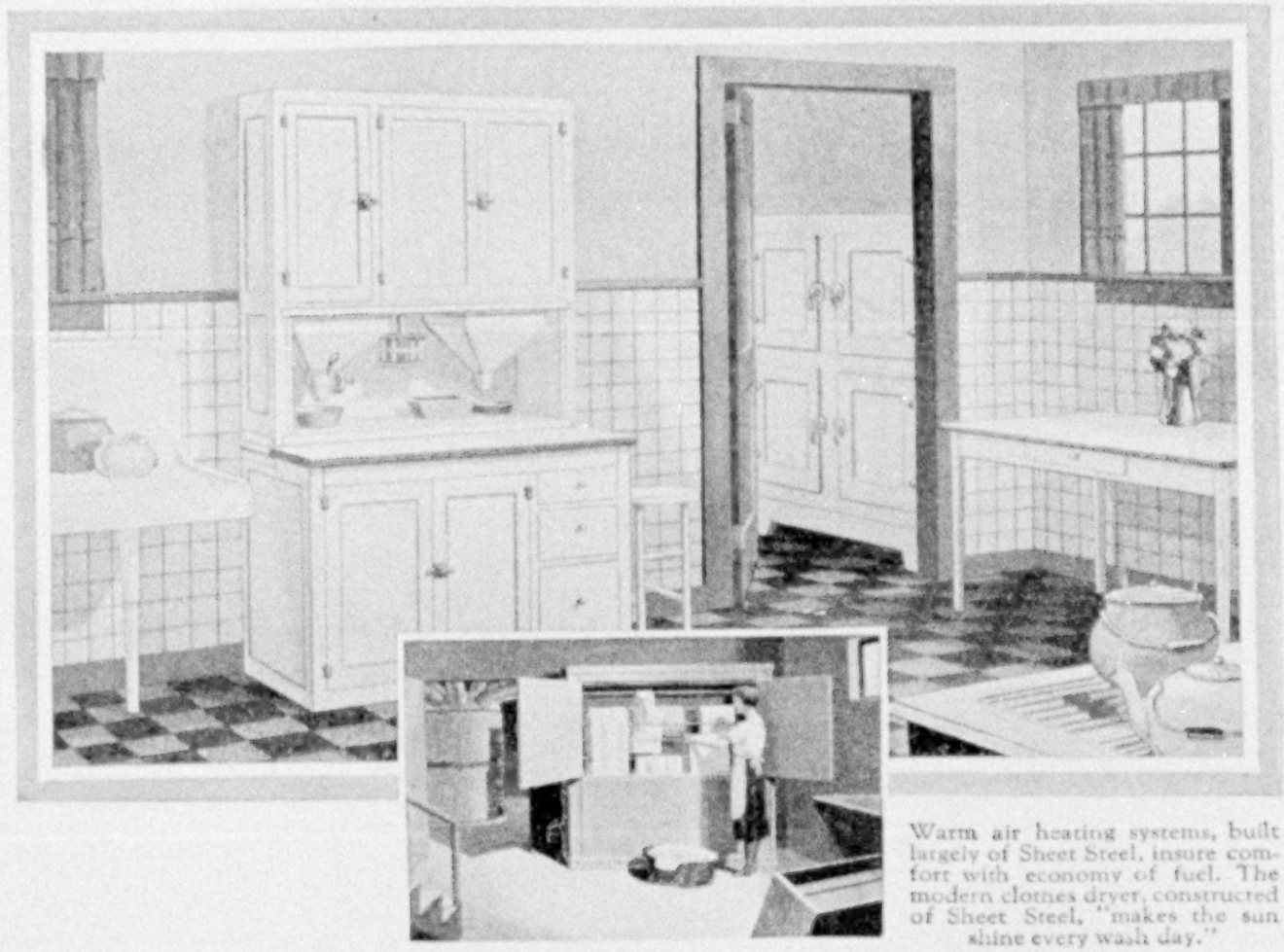
ARGOSY OF GEOGRAPHY

This old-time "Square Rigger," bowling along in mid-Gulf Stream, from a photograph by John Oliver La Gorce, preserves the full beauty, mystery, and power of the sea. Blue photogravure, 27 x 20 inches, on beveled Superfine Bristol—packed for convenient remailing to your friends.

$1.50; Framed, $3.00. Postpaid in U.S.

Illustrated List of 12 Other Panoramas Ranging from 50c. to $1 mailed on Request. Obtainable only from the

National Geographic Society Washington, D. C.



Warm air heating systems, built largely of Sheet Steel, insure comfort with economy of fuel. The modern clothes dryer, constructed of Sheet Steel, "makes the sun shine every wash day."

For Sanitary, Glistening Kitchens Use Sheet Steel

Kitchen walls of enameled Sheet Steel are waterproof, fire resisting and easy to keep always shining and spotless. Range, refrigerator, table top and kitchen cabinet of Sheet Steel absorb no smoke or grease from cooking, and a damp cloth keeps their glistening surfaces new and glossy. Cooking utensils of white enameled Sheet Steel insure sanitary cleanliness, less work and long wear.

Steel beds, dressers, dressing tables and other furniture, combine the durability of Sheet Steel with rare beauty of line and finish, duplicating the grain of finest woods or the glossiest enamel.

These are only a few of the many ways and forms in which Sheet Steel is making the home of today safer, more healthful, more convenient. You will be interested in reading about others in the illustrated booklet, "The Service of Sheet Steel To The Public." Write for it, free.

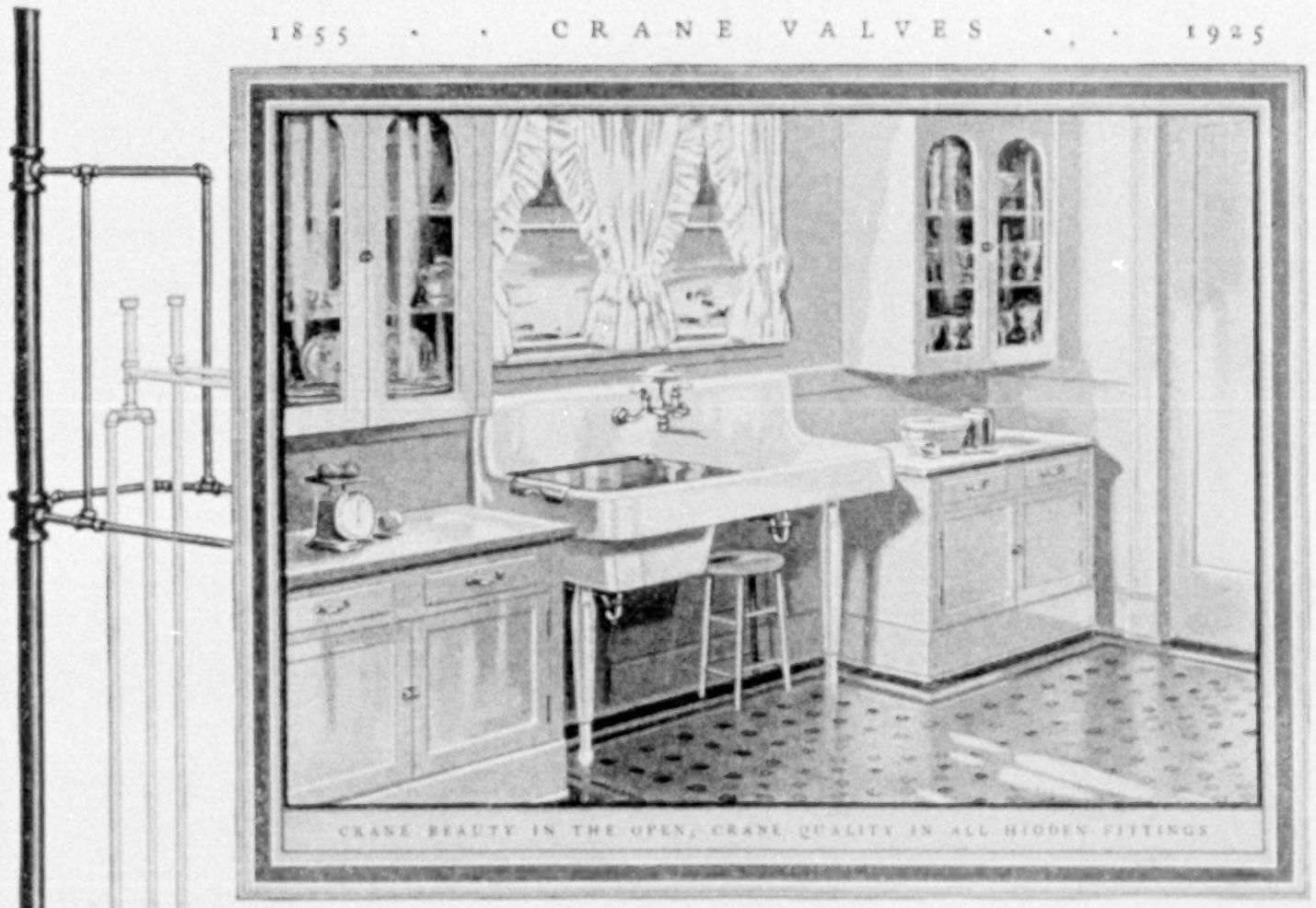
SHEET STEEL

TRADE EXTENSION COMMITTEE

OLIVER BUILDING

PITTSBURGH PENNSYLVANIA

1855 · · CRANE VALVES · · 1925



CRANE BEAUTY IN THE OPEN; CRANE QUALITY IN ALL HIDDEN FITTINGS

Saving space, time and endless steps in any home, this combined sink and laundry tub is especially useful and efficient in small apartments and bungalows.

Of cream-white enamel on iron, it takes up no more room than a sink alone, and costs much less than two separate units installed. It is large enough to meet any laundry emergency and is most convenient for washing small articles too delicate to risk outside. The nickel silver drainboard fits snugly on either sink or tub and may also be used as a serving tray.

Crane plumbing and heating fixtures, valves and fittings are sold everywhere by responsible contractors in a wide range of styles and prices. Write for kitchen folder and bathroom booklet.

CRANE

Address all inquiries to Crane Co., Chicago

GENERAL OFFICES: CRANE BUILDING, 836 S. MICHIGAN AVENUE, CHICAGO

Branches and Sales Offices in One Hundred and Fifty Cities

National Exhibit Rooms: Chicago, New York, Atlantic City, San Francisco and Montreal

Works: Chicago, Bridgeport, Birmingham, Chattanooga, Trenton and Montreal

CRANE EXPORT CORPORATION: NEW YORK, SAN FRANCISCO, SHANGHAI

CRANE LIMITED: CRANE BUILDING, 386 BEAVER HALL SQUARE, MONTREAL

CRANE-BENNETT, LTD., LONDON

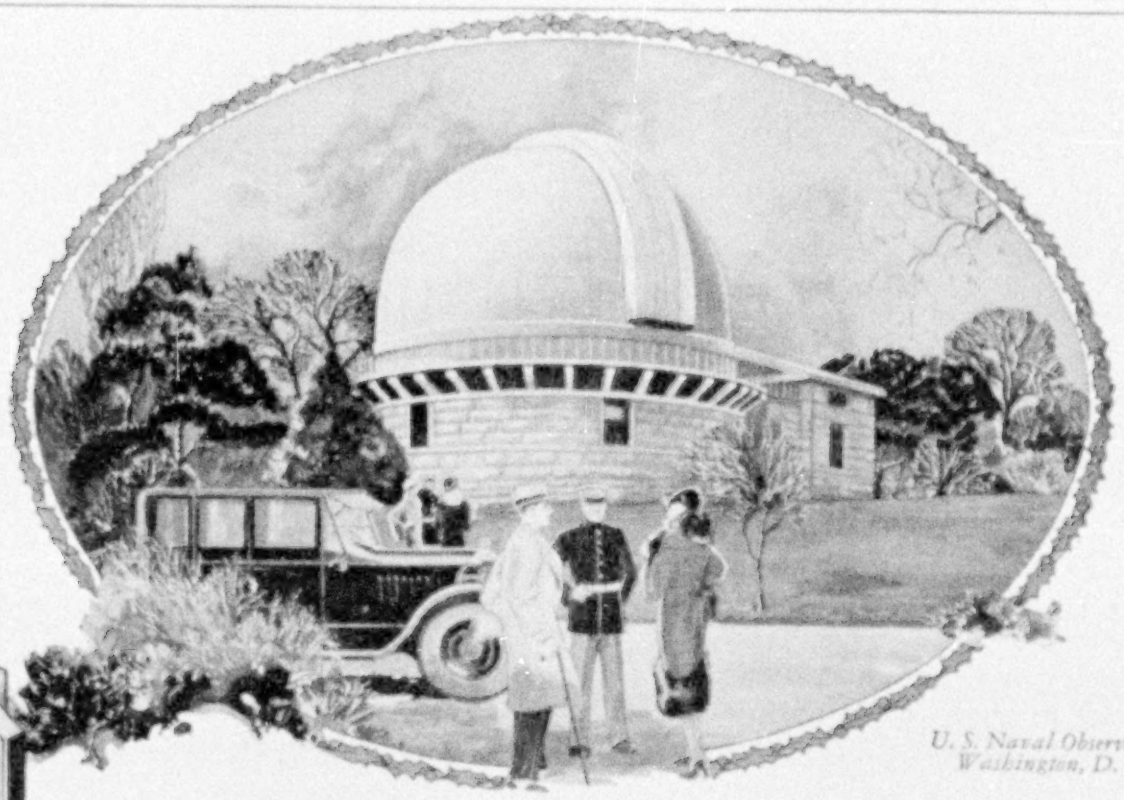
CIE CRANE: PARIS, NANTES, BRUSSELS

Removable drainboard is also a practical, convenient tray

Drainboard of nickel silver in place above laundry tray

A WITTNAUER CO. NEW YORK WATCHES

THE MOST HONORED WATCH IN THE WORLD



U. S. Naval Observatory
Washington, D. C.

With this inscription!

Give a Longines Watch this Christmas. Have this message inscribed in it: **"To tell you more than the time".** For with the "observatory accuracy" that is Longines' own, there is a beauty that enhances its life-long usefulness and makes it the supreme gift. Give a Longines – and know that no gift could express more gracefully your thought or sentiment through all the years to come.

From $35 to $1,000. At your jeweler's.

A. WITTNAUER CO.

Established 1866

New York Montreal Chicago Geneva

Official Government Observatory Awards

At U. S. Naval Observatory—Washington: Longines have been first in order of merit in all International Trials. Since 1916 more Longines Watches passed six months' Accuracy Trial and were accepted than all others combined.

At Geneva Observatory—Switzerland: This year Longines again obtained first prize of grouped watches, duplicating results of 1923 and 1924.

At Neuchatel Observatory—Switzerland: 365 awards in Accuracy Contests since 1905. During 1924 Longines received 17 first prizes.

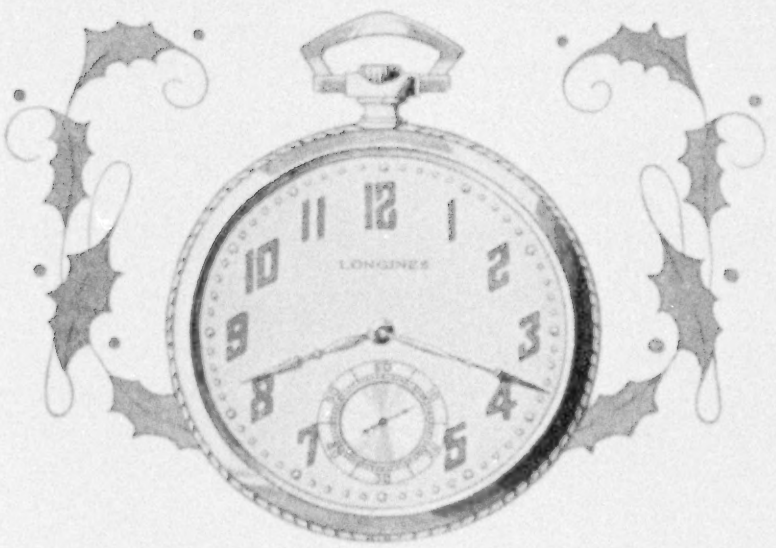
At Kew Teddington Observatory—England: 132 awards in Accuracy Contests since 1910 (1918 year's record for the best performance). Since 1919 every Longines Watch submitted passed trial with mention "especially good."

Grand Prizes Awarded Longines at International Exhibitions

Antwerp—1885	*Paris*—1889
Brussels—1897	*Paris*—1900
Milan —1906	*Genoa*—1914
Berne—1914	

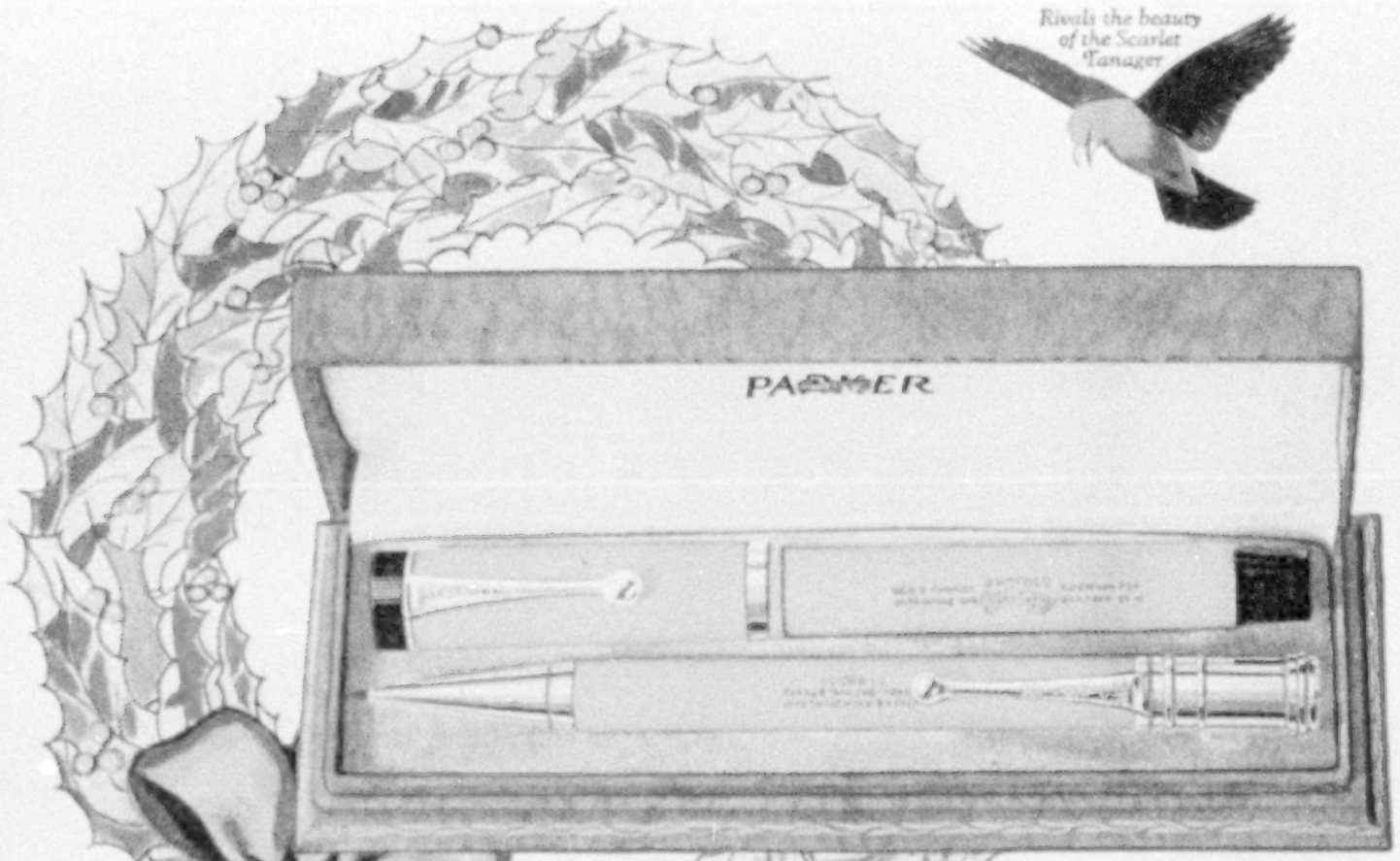
Since 1878 highest awards at all exhibitions.

THE *Longines* WATCH



The Gift Supreme

PRESS OF JUDD & DETWEILER, INC.
WASHINGTON, D. C.



Satin-lined Gift Case included in Sets— $8, $8.50 and $11— according to size

Red and Black Cover Combination Reg. Trade Mark U. S. Pat. Office

The Chief Attraction at Christmas Headquarters

Parker Duofold Duette

in Satin-Lined Gift Case de luxe

ORDER early—for as Christmas nears, there'll be standing room only at the counters where Parker Duofold Pens and Pencils are sold.

Many late shoppers were turned away last year empty handed—the supply of these beautiful sets was wholly inadequate. If you were one of those you know how true this is—how timely our caution to choose your Parker Duofolds ahead of all other gifts.

No other pen and pencil set can take the place of the Parker Duofold Duette in the hearts and hopes of your loved ones.

The shapely Black-tipped Lacquer-red Pen with Hand-size Grip, Free Swinging Balance and 25-year Point. And to match it, the Hand-size Pencil that turns lead OUT and IN.

Pens and Pencils sold separately if desired: Parker Over-size Duofold Pen, $7; Pencil, $4; Duofold Jr. size Pen, $5; Pencil, $3.50; Lady Duofold Pen, $5; Pencil, $3.

Now ready at all good pen counters.

THE PARKER PEN COMPANY · JANESVILLE, WISCONSIN

NEW YORK · CHICAGO · SAN FRANCISCO

THE PARKER FOUNTAIN PEN COMPANY, LIMITED, TORONTO, CANADA

THE PARKER PEN COMPANY, LIMITED, BUSH HOUSE, STRAND, LONDON, W. C.